NORTH AMERICAN REVIEW.

No. CLI.

APRIL, 1851.

ART. 1. — *A Greek and English Lexicon of the New Testament.* By EDWARD ROBINSON, D.D., LL. D., Professor of Biblical Literature in the Union Theological Seminary at New York. A New Edition, revised and in great part rewritten. New York: Harper & Brothers. 1850. 8vo. pp. 803.

IN no department of sacred or profane literature has there been so great improvement, in recent times, as in lexicography and grammar. It would be impossible to communicate an adequate idea of this to any reader, who was not practically acquainted with the older lexicons and grammars, before he used the recent ones. The philosophy of language is now so much better understood than it was a half century ago, as to lay the foundation for important improvements, not only in the manner and method of representation, but in the development of the forms of words, of the nicer significations dependent on these forms, and of the syntax or manner and order of combining words in a sentence. On these, every thing depends in enucleating the meaning of any language; and cases of real difficulty can hardly be met in an adequate manner, without an accurate knowledge of the minutiæ of both the grammar and lexicography of the language which one undertakes to interpret. Now and then, the solution of a difficulty depends on the knowledge of antiquities and of historical facts, and without such knowledge, no satisfactory ex-

planation, in such cases, is feasible. Hence the appellation of *historico-grammatical interpretation* is given to the now generally admitted and established rules of exegesis.

In studying a dead language, we first of all resort to a lexicon for the meaning of each particular word; and then we must consult the grammar, in order to find out what modifications of sense and expressions of relation are designated by the various forms of words, whether verbs or nouns, and finally, to determine the manner in which the words of every sentence may or must be arranged. We cannot make an inch of headway without going through all this process. The first part, the consultation of a lexicon, every one spontaneously feels to be necessary. But the other parts of the work are not less so. Take, for example, the very first verse in the Bible, which in Hebrew runs thus: "*In the beginning, created God the heavens and the earth.*" Now in English, the unlearned reader, at least, might be puzzled to know, when he first perused this sentence, whether it means to say that *the heavens created God*, or *God created the heavens*. In English, which is literal (if we may so speak) in respect to the *order* of words as well as to their signification, the sentence is, at least in appearance, equivocal; and the predominant construction in such a case, drawn from analogy in our language, would be that in which the *accusative* case immediately follows the verb. A reader of the Bible in general would indeed know, that such a method of interpretation here would contradict the tenor of the Scriptures, and make little less than nonsense. But if we should take a reader who knew nothing of the Bible, and direct him to the sentence in question, arranged in the Hebrew manner, he must be greatly puzzled, if not misled. Yet in Hebrew, all is plain and lucid. The Hebrews more commonly put the subject of a sentence *after* the main verb, unless some special emphasis on it were intended, and then it was placed *before* the verb. In the present case, the emphasis lies on the verb *created*, because the sequel exhibits a history of the *creation*. And then, before the word *heavens*, the Hebrew here places a particle, (אֵת) which is used to mark the accusative in any case, where doubt might arise. The Hebrew, then, is clear as the light. But suppose a person were to read this verse by the help of his lexicon only, and knew nothing

of the accustomed method of the Hebrew in regard to the position of the nominative, and nothing of the proper definitive power of the particle in syntax; how could he satisfy himself of the meaning of the verse, unless, indeed, he might do it by a subsequent perusal of the context?

This is only one of the thousands of like cases that occur, both in Hebrew and Greek. In the latter language, however, the accusative is marked (neuter nouns and adjectives excepted) by the manner in which the word terminates. But in Hebrew, as in English, some cases are not marked by their terminations. The reader is obliged, therefore, to resort to other means, in order to distinguish the nominative and accusative, or subject and object. Prepositions come to our aid here in English, for the most part; but in the Hebrew, there are cases almost without number, where the accusative of time, of manner, of means, etc., has neither ending nor particle to distinguish it from the nominative. Other means than those of forms, or even of syntax, must often be resorted to here. They belong to, or consist in, the diacritical knowledge of the interpreter; for without this, he could effect nothing satisfactory.

It is in relation to such subjects as the preceding remarks bring to view, that most of the modern advances in grammar and lexicography have taken place. Not many new meanings of words have been discovered, nor have many principles of forms or syntax absolutely new been developed. But where confusion once reigned, order is now introduced; where a miscellaneous list of facts was once exhibited, regular sequency, dependence, and connection are orderly presented; where examples or satisfactory proof of this portion of syntax or of that, of this meaning or of that, were once wanting, the lack has for the most part been supplied. All the stores of antiquity have been ransacked, in order to find material for filling out and perfecting both grammars and lexicons. Etymology has been immeasurably advanced. The languages, not only of the Semitic tribes, but of the remotest East, the Zend, and its eldest daughter, the Sanscrit, have been somewhat thoroughly explored, and there have been found abundant affinities in them with Greek and Latin, and with most of the European languages, which have received the new name of *Indo-European* languages.

Besides the remarkable etymological researches after the *parent-roots* of words, the *philosophy* of language, both grammatically and lexically considered, has made advances never dreamed of by the older lexicographers and grammarians. That language affords abundant material to engage the attention of philosophical minds, must be evident to the mere tyro in the study of it. As Jerome said of the Scripture, "Although it has shoals in which the child may wade, it has depths in which the elephant may swim." Indeed, it is difficult to conceive that a person may attain a just estimate of this subject, without supposing him to become interested, and even enthusiastic, in the pursuit of it. For what is *language?* It is the external expression of the internal soul of man. Man is gifted with the power of forming words, a power at once astonishing in its exhibition and boundless in its extent, and one capable of infinite variegation in the manner of its exercise. Human language has, of course, enstamped upon it the history of man's thoughts, the picture of his mind. Had we the whole store of the words of any nation, and the means of getting at their true signification, we might congratulate ourselves on possessing immeasurably the most certain, extensive, and interesting history of that nation which could be written. There may be histories in abundance of all the external changes and commotions of that nation, of its extent, its power, its prosperity or adversity, its independence or subjection, its tumults within and the aggressions made upon it from without; and the accounts of all these may be even particular and abundant; but still there is only a partial anthropology here. The fate and fortune of a nation, its external or internal relations in a civil point of view, are by far the least interesting part of its history. It is the *soul*, the *mind*, which is the man, and not what he accomplishes by animal strength, nor even what is done in the way and for the sake of satisfying animal wants. Language is the development of the soul; it gives us at once a view of the *psychical* condition of any people. What did they think? how did they feel? in what way did they reason or persuade? in what light did they view things that are without or within? in what sciences did they make progress? what were their moral and intellectual sources of joy or of grief? what were their views of themselves in their then present condition, and

what their expectations in regard to the future? These and the like matters are all enstamped upon a language, in characters unmistakable and deeply impressed. *Words are signs of ideas*, whether written or spoken. When written, they are the visible signs or symbols of what passes in the interior man. They show us his course of thought and feeling and reasoning; they develop the objects which most excited and interested him; they show the degree of his culture and knowledge; they discover what passed within him in such a way, that we may see how high or low he stood in the scale of human intellect, and rational improvement and enjoyment. In a word, they are *the history of his soul*, just as the usual accounts of external events are the history (so to speak) of his body.

In languages where we have specimens of earlier and later writers, we can distinctly trace the history of progress in any nation. Any new art, science, or discovery, will introduce new words in order to designate things that are new. Look, for example, at the sciences of chemistry and geology, both scarcely a half century old, when considered as proper sciences; what an infinitude of new words have they demanded and occasioned! A future reader of English, in a distant land, when he comes down to our day, will discover at once when these sciences were introduced, and will argue the gradual progress of them, from the progress made in terminology. Just so of the past. When particular words, indicative of office, place, privilege, rank, science, art, and the like, begin to be employed, then began something new in respect to the objects themselves which are designated. Words are always formed for use, and either from necessity or convenience. No people lays up a store of them beforehand, ready for use when wanted. A critical philologist will find, then, in the language itself which he studies, the history of the culture and advance of any people; and he will be better able to tell us what they were as sentient and rational beings, by the study of their language, than by all the histories extant, written in the ordinary manner. No wonder that he who studies the true philosophy of language, in all its bearings on anthropology, or on the real development of man in the highest sense of this word, should become enthusiastic in the pursuit of this knowledge. We repeat it,

that there is more to be known of man as a rational, sentient, religious being, by the study of his language, than by all the external history in the world. Through that medium, we may look directly upon the very mind or soul of any people, and judge of them as to all their capacities and attainments.

Many causes have contributed to give impulse to the study of language, since the nineteenth century commenced. The better knowledge of the Zend and the Sanscrit, the deciphered hieroglyphics of Egypt, and more recently of those of ancient Persia, Media, and Assyria, — all contribute their share in diffusing abroad, among the lovers of knowledge, a deep interest in the study of the ancient tongues. Every month is now adding materials for reflection and philosophizing, not merely on the historical facts related, but on the cognate and congener parent-roots, in all these languages, as tending to establish a descent from one common stock.

With all this expansion of linguistic knowledge, have come great improvements in the exhibition of the forms and structures of words, and especially of the manner in which the secondary, tertiary, etc., significations of them came to be deduced from the original root. Grammars have been improved beyond any anticipated measure, not only in the classification and exhibition of the forms of words, but, most of all, in syntax. Compare, for example, the syntax in the older Greek grammars, with those of Matthiæ, Kühner, and others, or with Winer for the New Testament Greek; and in Hebrew, compare Buxtorf's Hebrew grammar (a good book in its time) with Gesenius and Ewald. So as to Hebrew and Greek lexicons. Buxtorf made an excellent manual Hebrew lexicon for his time. Even now it is worthy of consultation. But what a distance there is between his work and that of the *Thesaurus* of Gesenius! And so in Greek. Compare Schrevel or Hederic with Passow, Pape, Rost, and others, or with Liddell and Scott, as we now have them in the excellent edition of the Harpers, edited by that promising Greek aspirant, Prof. Drisler. How rude, how arbitrary, do many of the meanings of words appear, as exhibited by Schrevel and Hederic, in comparison with the same as exhibited in Passow, and in several of his successors and improvers! In recent lexicography, the literal and ori-

ginal meaning, being ranged first in order, is regarded as the root and trunk of the tree. From this, branches shoot off, spreading out wide at times, and giving birth to other and subordinate, or secondary branches. Not unfrequently, several main branches spring out of a trunk, which still remains, even to the top of the tree, but diminished (as is natural) in size, and, it may be, varied in shape. But all the branches still cling to the trunk; the main ones directly and immediately, the smaller ones mediately, and only by the aid of the larger. It is in respect to the beautiful proportions, connections, and mutual dependencies of the several parts of this tree, that the drawings of recent lexicographers excel. In Hederic and his compeers, we may find, perhaps, the trunk and every important limb belonging to the tree; but they are *disjecta membra*. One limb is here and another there; but where they once grew and were fitted on, we are not informed. As little do we know, why they are reckoned as belonging to this particular trunk or that, rather than to some other one. There they are, or may be; but the *why* of this arrangement is a secret not communicated to the scholar. Very different is the tree, as portrayed by recent hands. There it stands, in comely form and proportion, every large limb shooting out naturally from the trunk, and every small limb pushing forth from its immediate parent, the larger one. The leaves of the tree even are not wanting; for these are the passages quoted from the classics, and brought to illustrate and confirm the meaning given. What scholar has not heard of a *Greek tree?* But this was made out, in days of yore, only from the derived tenses of verbs. But here is now a *lexical* as well as a grammatical tree, and far more comely and fruit-bearing than the other. Indeed, the theory of the *lexical tree* belongs to some of the most subtile and diacritical parts of the philosophy of language. Gesenius led the van in Hebrew; Passow in Greek. Some of Passow's editors and emendators have done more than their master in giving finish to the lexical tree, and adorning it with comeliness as well as fruit. Who is to improve on Gesenius in Hebrew, remains yet to be seen. But there are Hebrew scholars now living, who are capable of doing this; as the lexical remarks here and there in their commentaries abundantly show. However, the work is great and appalling to most men, especially when

otherwise busily engaged in teaching. But enthusiasm will doubtless accomplish it in due time.

In respect to Greek, there are many things still wanting in Passow, and even in his emendators, Liddell and Scott, who have done nobly in the way of improvement. But there yet remains much land to be possessed. We may appeal to the *verb*, for example, and to its different meanings, proximate and remote. We need still fuller accounts of its irregular forms; of the respective meanings of its voices; of its usable and unusable tenses or persons; of its synonymes or equivalents, (for who has done much to the purpose here?) of its construction before different prepositions, and how it modifies them, or is modified by them; how and why it comes to be connected with such prepositions; what modification is made by *compounding* the verb with such and such prepositions, and why; what cases it must govern, (so to speak,) and why it governs them; and what cases it cannot govern, and why. The subtile philosophy of grammar and lexical science, in pointing out the *why* and the *wherefore*, in respect to the nature of cases that follow, as founded both on the relations which they are designed to express, and on the nature of the action designated by the verb, should be brought fully into action here. As yet, we have all this only in an incipient state, in most lexicons. The student may be told that this verb governs the genitive or the dative, instead of the accusative; that another can take only the accusative; but the *why* is often, nay, usually, left in the dark.

Now our idea of a perfect lexicon is such, that we deem it not complete when it tells us merely of the various meanings of a verb, or has shown us how they are derived, and in what order. It should also tell us why a genitive, or dative, or accusative, must stand after it, and how the same verb may take different cases after it, and how and why the sense is modified when this is the case. The basis of syntax, the *reason* or *ground* of it, is what we desire; and not a mere assurance of the simple fact, that a verb governs such or such a case. *There is a reason in all things*, says the old proverb; and there is one, at any rate, in the syntax of Greek verbs, although few have thoroughly developed it.

When all this is done, and we have, moreover, the history of the use of the word in its different senses, in all the differ-

ent stages of the language, then we have fully and fairly a *lexical* account of the word in question. Let any one look at most of the lexicons, and see how far they come short of all this. But the *complete* work is one of time. Not one generation, or even one half century, can be expected to perfect it. Such a lexicon would be a large book, if fortified by examples; and yet, compression in such cases can be carried a great way. De Wette, Hitzig, and Knobel, are conspicuous examples of this, in some of the lexical passages in their commentaries.

In respect to NOUNS, the task of adequate exhibition is sometimes rendered very difficult, when they are the names of *things* entirely foreign to our times and country. We are persuaded that where any remains of such things have been found, and sketches of them made by skilful engravers, it will be found the easiest, best, and shortest course in the end, to have these sketches copied on a reduced scale, and inserted in the lexicon itself. Professor Smith's excellent book of Greek and Roman Antiquities shows what may be efficiently done here. In many cases, a sketch or outline view of the object named would save a large space now occupied by an attempted description, and give a far more correct and definite idea to the student. We cannot but hope soon to see every *Real-lexicon*, as the Germans call such, namely, every lexicon which describes *things* foreign and strange, furnished with such an auxiliary apparatus.

In regard to other nouns, significant of things not palpable and visible, but intellectual and speculative, there is sometimes serious difficulty in making out the *lexical tree*, of which we have spoken. A *genetic* account of each species of meaning, the proof of its legitimate descent, and from what family, are not always things obvious and ready at hand. It oftentimes needs a subtle, discriminating, well-exercised philological tact, to accomplish this in a satisfactory manner. Any thing short of this will be exposed to blunders. Open Parkhurst's Hebrew Lexicon, and inspect the Hebrew words that correspond to *heavens*, *Elohim* or *God*, *cherubim*, etc. Even good old Schleusner (peace to his memory and his ashes!) exhibits many an example of failure. Yes, peace to his ashes! we say again; for he was the harbinger of a brighter and better day for New Testament lexicography. "With all his faults,

we love him still;" for under his guidance we made our *début* on the field of New Testament philology. We are sorry to learn, that his last years at Wittenberg were darkened by the dismantling of that university, where Luther was so long the presiding genius. To a friend of ours, not long before his death, he said with great feeling, in reference to the ancient university, then reduced to an academy of theology, *Fuit Ilium.* Yes, Ilium had been, and had produced many a Hector in the holy warfare of the Protestants with their persecutors. And something like what Luther did in matters of theology, Schleusner himself, neither a great theologian nor an acute philologist, lived to accomplish, in regard to a revolution in the lexical department of New Testament Greek. Many a hint has he given to show the way to travellers more sharp-sighted than himself, for which their debt of gratitude is due. Even his errors are admonitory, for they teach us how to shun them. But we are digressing.

We return to another branch of lexicography, in respect to the New Testament. We have said nothing yet respecting the PARTICLES, apparently, at first view, the most insignificant of all the ingredients which compose a language, but in reality the most difficult, the most subtle, and in some respects, (especially as regards the *logic* and *rhetoric* of discourse,) the most important and controlling of all. What a wilderness do we descry the moment that we look into the old lexicons and search out these! Rather, we might almost say, what a desert! Some obvious and leading significations, of course, are given. But beyond that, what have we? The multitude of tints and hues which many of them give to discourse; the force and intensity, or the doubt and uncertainty in the speaker's mind, which many of them designate; the light and shade which they diffuse over a whole sentence or paragraph; the logical connection of thought and reasoning which some of them point out; the tone of moderated or impetuous assertion which others mark; — these, and many more of the nicer qualities which the particles were designed to portray, are all but entirely wanting in the older lexicons. We have said that they are the most *difficult* part of language. It is quite true. They are the last thing that a Greek student fully attains; certainly, the latest things to which the lexicons have in any good measure attained. It is no wonder. They seem,

at first, to be the most easy and obvious of words. So, in some of their primary meanings, most of them are. Hence they are not watched, nor their variations of meaning carefully noted. Every now and then, we find many of them introduced in particular passages, where they wear the air of intruders; and here, instead of being pointed out, and duly defined in the lexicons, they are merely proscribed by a simple *pleonastice*, or *abundat*, or *expletive*. In other words, the writer, if we are to believe the lexicographer, has inserted a word without any meaning, or at most, a mere idle word. What is the admiring reader to do with his Plato, his Xenophon, his Homer, or his New Testament, when he is bid to regard the authors as using words without any meaning? No; this will never do. It may serve, perhaps, to veil the ignorance of the lexicographer; but it does little to help the student. Rather must we say, it actually misleads him.

Particles are the very *joints* and *bands* of discourse; or, to use other similes, they are the joints of a frame; or they are the hinges on which gates and doors turn, and are opened or shut. Nothing can exceed the nicety and delicacy of shading which the Greek particles give to a picture. Put a tyro to reading Plato or Xenophon, those consummate masters of light and shade in a picture, and what idea does he get from one half of the particles with which he meets? Just none at all. He must fall back upon the old solution (wrongly so called) of *abundat, expletivum est*. Put Schleiermacher, or Herder, or Lobeck, or Stalbaum, or Porson, to read the same passages; and do they find any *superfluity* of words, in these renowned masters of language and æsthetical coloring? No; every word adds a new tint, or softens some one which seemed to be too strong. All the emotions of their minds, their clear convictions, their doubts, their assumptions, their assertions, their designed conditionalities, their hesitation, their higher or lower persuasion, even their hopes or their fears, are all made out more or less by throwing in particles of different kinds, adapted to all the various designs of the discourse. They are like the different colors on a painter's pallet, now communicating one tint, now another. Sometimes, too, they give a mingled tint, by being combined; and may be compared to the effect of a meeting of colors in the rainbow. In the hands of such painters as Plato and Xeno-

phon, they adorn, and vivify, and qualify, and mitigate, and strengthen, and render prominent, the pictures which they help to draw. A man who understands not their use well, may attain indeed to the substantial meaning of a Greek sentence, in either of these or of the like authors; but all the delicate tints of light and shade, of strength and beauty, are beyond his reach. They are a picture put before the eyes of one who has no power of vision.

Little, indeed, did lexicographers in days of yore think of these matters, and still less have they done to make them plain to others. Yet blunders here are sometimes of more serious importance than the mere loss occasioned by want of power to see light and shade. What if we are told to render a *causal* or an *illative* particle, in reasoning, by a particle not relating at all to such a connection? For example, good old Schleusner tells us, that γάρ sometimes means *nempe*, sometimes *autem*, *vero*, and sometimes *sane*, *profecto*; and then, to conclude the matter, γάρ is sometimes merely *completiva*, and sometimes *redundat*. Can we well believe, that a *causal* particle, which stands before the reason or ground of a thing, can assume phases so diverse, not to say opposite? It is true, indeed, that, in the passages to which he appeals in proof of all this, the particles which he gives as the proper translation would agree in the mind with a good sense of the passage; but the question is not, whether this may be true, but whether the writer did not give the sentence a different shape or coloring in his own mind. Philology, as it now is, would say, *Yes, he did*. And as to the *completiva* and the *redundat*, it would turn away with a feeling little short of scorn.

Such are and have been the difficulties, and the efforts to overcome them, on the part of grammarians and lexicographers. But of late, many monograms and even volumes on all the leading particles have been written by the hands of masters; and although all has not been done that should be done, we are at least on the high road to other discoveries. In due time they will come. But let us remember, that we are at present no travellers on a railroad, in order to reach the land of discovery. *Slow and sure* is a better mode of travelling in this region. Still, we can easily find adventurers who have made haste; and we cannot dismiss this theme about the *particles* without a glance at some of their efforts.

Let us take, as an example comparatively recent, the venerable Schleusner, who has already been mentioned. What says he on Καί? He gives us no less than thirty-two different meanings, and then adds, *interdum abundat*, in the thirty-third place, and in the thirty-fourth, *deficit interdum*. Finally, he adds, *Restant aliæ significationes*, which he goes on to give to the number of *six*, averring that nearly all interpreters admit them. Among these are *aliquando*, *cum*, *quamdiu*, *quanto magis*. What else now is this, but *deducere aliquid ex aliquo?* Even the tyro, at the present time, can see this to be preposterous. We shall attempt, however, no minute examination or refutation of such an extravagance. Hear that acute and excellent philologist and grammarian, Prof. Winer. "Καί," says he, (Gramm. § 57, 2,) "has only *two* leading primary ideas, *and* and *also*, both comprised in the Latin *et*." In other words, (a little different and more exact,) Καί is both a *conjunction* and an *intensive adverb*. In the latter case, being *adverbial*, it corresponds to our *even*, or *and indeed*, and sometimes is untranslatable, as in questions and commands. By usage, however, it gives intensity to them; a similar practice we can discern occasionally, in our own language. One person is telling another, for example, of a peril into which a mutual friend had fallen. The other interrupts him, and says, *And what did he do?* Is not this of quite a different shade and complexion from the simple and nude, *What did he do?* Every one feels it to be so, although he may not be able to describe the difference. So, too, in *imperative* sentences; for example, Καί μοι δὸς τὴν χεῖρα, literally, *and give me your hand*. But this does not translate the expression, in accordance with the true spirit of the Greek. This implies that preceding words or actions are in view, and the Καί makes the phrase mean as much as we should mean by saying, *In connection with this matter, give me your hand*. But the energic power evaporates in the English. Καί marks the connection and rapid succession, and also the animation, of the command. How difficult it is to translate all this, every scholar must of course know. In the New Testament, this *imperative* use of Καί is not much developed. But it is quite common in the classics. We approach near to it when we say, *give me your hand now*, or *give me your hand then*. With pronouns, the use is more simple, as καὶ ὑμεῖς ἐστέ σοφοί,

that is, *even you are wise.* Different would be the meaning in αὐτοὶ καὶ ὑμεῖς εἰσὶ σοφοί, *they and you* are wise. In the first place, Καί is an adverb; in the second, a mere conjunctive. Under the *adverbial* genus, many shades or species of translation can and must be given, according to the nature of the context; and this is allowable, because Καί as an adverb, has the *generic* nature of an *intensive*, and this, of course, comprises several species. In the admirable lexical article on Καί, which Kühner has given in his large Grammar, these are finely developed. His results are, *gar, sogar, noch; ganz, recht, schon, auch schon; noch, auch noch, auch nur.* The German goes so far beyond us in the richness of its *qualifying* and *intensifying* apparatus, that we will not hazard the attempt to translate all these words into English.

One thing more must be noted. This is, that in the New Testament Greek, καί not unfrequently answers to the Hebrew ו, in its peculiar meanings. Nothing was more natural than this, in a Hebrew-Greek writer. If the classical καί corresponded to the Hebrew ו in nine cases out of ten, it was nearly a matter of course for a Hebrew, who wrote Greek, to use it as corresponding to the tenth. And so we have it in the New Testament; for example, καί, *and so, and thus, and then, and yet, and still.* So καί often stands before the *apodosis* of a sentence, like the Hebrew ו, in which case it may be rendered *then, and then, and therefore,* etc., according to the nature of the sense required. Nothing can be plainer than that Schleusner, and even Wahl and Bretschneider, as exhibited in their respective lexicons, were at best but little acquainted with Hebrew. They rarely bring it to bear on the matter before them, except as to particular and peculiar phrases; and when they do, *aliquando bonus dormitat.* Yet all of these writers hold Hebrew knowledge to be indispensable to the interpretation of the New Testament Greek; while they have profited but very moderately by it.

But we find ourselves writing a lexicon instead of merely criticizing one. Our apology is, that we cannot criticize to any good purpose here, without showing *what* ought to be done, and *how* it should be done; and we can duly illustrate our meaning only by some examples. But enough of these for the present. There would be no end, if we examined all cases, or even those of importance. What we have said of

Καί, may be said, for substance, of many of the leading particles. There is either a nude skeleton, as in the older lexicons; or, when criticism had leaped over to the opposite extreme, there is an absolute plethora, — an image of Titanian magnitude, and with as many hands as Briareus. In the times of this opposite extreme Schleusner lived, and his lexicon partakes of the extravagance of those times. But it is the result of long, patient, and severe study; it embodies much that is contained in the best of the older commentaries; as a *Real-lexicon*, it has many good points; and as a faithful exhibition, with vouchers, of the meaning of words, in most cases, it is a safe and commodious guide. But as a *grammatical critic*, Schleusner has very moderate pretensions. When he wrote, grammar was just beginning to awake to new life, and to shake off the dust of ages. The art of lexical criticism was also in its minority, as any one may see, who consults the works of Pasor, Dieteric, Mintert, Leigh, Stock, Schwarz, Schoettgen, Krebs, and Parkhurst. In Schleusner, we see the transition state from the old *régime* to the new. His work is a great improvement on prior works of this nature. But we also may now say, *fuit Ilium*. His lexicon is, at present, almost one of the things that belong to the history of the past, like the works of Schrevel and Hederic. Lexicograhy, since his time, has become a *science;* one that has been fostered and adorned by some of the most acute minds in philological discriminations. It has its metes and bounds, as truly as hermeneutics. Indeed, the two sciences must go hand in hand, in order to reach the goal destined for both.

Wahl saw the defects of Schleusner, and attempted to remedy them. He brought to the task a good acquaintance with the Greek classics, and very considerable experience in the interpretation of Scripture. His work made a good degree of impression on the German public, and was received with so much favor as to go through repeated editions; the last of them, as we believe, (for we have not the work at hand,) in a condensed form, and in several respects improved. It was his lexicon, published a little before 1825, which was translated, with some additions, by Dr. Robinson, and published in the year just named. Wahl was not remarkable for special talents or acquisitions of the highest

order. He was diligent, even somewhat plodding, and not destitute of philological tact; but his *lexical-trees* sometimes look like our Lombardy poplars. The taste, the acumen, the philosophy, necessary to construct them and render them comely and well-proportioned, were not in him, and he could not command them at his will. He has all becoming *Dutch diligence*, wonderful patience in chase of *minutiæ*, and, in not a few cases, he makes distinctions not founded on differences, and differences not founded on distinctions, in the Greek text. One most important qualification was lacking, namely, — a deep and radical knowledge of the Old Testament idiom and language. It is in vain to think of reaching the summit of New Testament lexicography, without a radical knowledge of the Old Testament idiom.

Contemporary with Wahl, and independent of his work, was the New Testament lexicon of C. G. Bretschneider, published in 1824. It is of about the same size as that of Wahl, that is, two moderate volumes octavo. It is the work of a man of distinguished talent and powerful mind, who, had he been bred to philology, would doubtless have made distinguished proficiency in it. But the author had a system of Theology, and other works, in hand, and had little leisure to pursue critical linguistic studies with all his might. Still he has shown, under these embarrassments, not a little of industry, and also of tact. His work is not a mere compilation. He has paid much attention to the Septuagint Greek, to the writings of Josephus, and to all the earlier pseudepigraphs of the New or Old Testament, which are written in Greek. Philo, and the early Greek fathers, too, have not been altogether neglected. In this way, he has added something to the material for illustration and confirmation, which may be drawn from Hebrew-Greek writings composed a little before and after the time when the New Testament was written. For strength and clearness of conception, for logical power and discriminating acumen, Bretschneider has been highly distinguished in many of his works; and even in his lexicon these qualities are very apparent. Yet he had too many things to do, to permit him to steep himself in the idioms of either Testament; and sometimes he decides more as a psychologist, or a metaphysician, than as a philologist. But he has no little tact at exegesis, in consequence of his acumen

in discerning the logical sequency of a discourse. His work has been reprinted, we believe, more than once, and had he devoted to it as much time and patience as Wahl did to his, there can be no doubt that he would have carried away the palm from his contemporary. But he became engaged, at last, bitterly engaged, in controversy about neology, having become a convert to it in his old age, and writing even romances in its defence. In the mean time, the lexicon was left to shift for itself. In regard to its present repute, and the rank now assigned to it among the Germans, we possess no satisfactory information. We can say, however, from experience, that this lexicon will rarely fail to repay the student for consulting it.

In 1836, Dr. Robinson published his own New Testament lexicon, on which he had bestowed several years of labor. It is sufficient here to say of this, that three rival editions of it were speedily published in Great Britain, and subsequently two abridgments of it. The new edition, whose title stands at the head of this article, is the fruit of three more years' labor, in the best part of his life, and at the period of his full maturity. The helps which were now at his command, were of the highest order and importance. Wahl's and Bretschneider's lexicons had been republished with improvements. Winer had made many additions to his grammar; and Passow had been republished under the care of able successors, not to mention Pape and other Greek lexicographers. Liddell and Scott had issued their noble work; and, in commentary, De Wette, Meyer, and others had written distinguished works. Dr. Robinson, moreover, had himself been engaged in the daily explanation of the New Testament, for more than ten years. He had visited the lands of the Bible in person, and given to the world the only classical book on the subject of Palestine-topography, since the days of Adrian Reland; and a better one than even his. Besides all this, he came to his task furnished with a scholarlike knowledge of the ancient Greek classics; and, what is even more than this, in such an undertaking as his, he had enjoyed the best opportunities, in translating and publishing the Hebrew lexicon of Gesenius, to become extensively and accurately acquainted with the original Hebrew language. We must add to this, an almost vernacular knowledge of the German,

while a familiar acquaintance with the French, Arabic, Chaldee, and Syriac, had been a portion of his pastime. In short, it seems to us that he possessed all the keys of knowledge in relation to the treasures which were to be described and defined. Long practice in the exegesis of both Testaments had led him to the attentive study of all idiomatic and difficult passages; and his familiar acquaintance with Hebrew, Greek, and Roman antiquities and history, of course opened to him all the sources from which testimony or aid was to be drawn. Last of all, his unquenchable thirst for knowledge, his iron diligence, his firm and unalterable perseverance, and his sound judgment and discrimination, not only give him an unusual power of accomplishing, but of accomplishing in an able and satisfactory manner.

It is no wonder, then, that he has given us an excellent work, after laboring so long upon it, and with such ardor. He seems to unite the persevering enthusiasm of the Germans (among whom he has lived for several years) with the sobriety and sound judgment of the Englishman. We have sometimes wondered at the patience of the man, when we have read some of his articles, where a countless host of testimonies are appealed to, every one of which had been inspected and examined by him in its original source. When we examine these, we are led to give full assent to Scaliger, who said that "a part of the daily prayer of every literary man should be thanksgiving to God, that he had been pleased to make lexicographers and grammarians." Most persons, we well know, regard such studies as repulsive, and wonder at them. But we have seen, if not felt, that they may come to possess the highest degree of interest. Dr. Johnson, our English corypheus in lexical matters, did indeed perform much labor in his way; but not, it seems, with much loving attachment. Every one is familiar with his contemptuous and taunting definition of a lexicographer, namely, *a harmless drudge*. It was the *drudge* part which exasperated him; for he loved rioting in books, much better than the laborious making of them. Not so a real philologist. We shall hear from him no whinings about the disgusting tedium of his labors; no complaints of haughty neglect and disdain shown by those who wore coronets. Listen to Passow, the great reformer in recent Greek lexicography: "When I fall upon

the half complaining, half boasting passages in the prefaces to many lexicons, and light everywhere in them upon expressions of sore vexation, disgust, and abhorrence, even so that I can in no way imagine what has chained these groaning sufferers so long to the hated row-benches of the galley, I know not whether I shall find credence, when I assure the reader, that the rich, the endlessly manifold, and the ever new occupations of the mind, which this branch of philological study affords me, have rewarded me superabundantly for all my toil; without which consciousness, no earnest efforts to enlarge our scientific knowledge are possible." *Pref. to edit.* 1825. In another place, he says: "It is common for the writers of dictionaries to complain of their tedious, protracted, hateful toil, in order, as it would seem, to set off their pre-eminent regard for the public, in submitting to be drudges so long for their profit. One would think, that the best way to recommend a book to the reader, is not to tell him that every line in it was written with disgust and abhorrence. What sort of a recommendation is this? I have no such story to tell. On the contrary, I have labored more than twenty years on this work, and instead of being stretched on the rack all that time, I have been only swimming in an ocean of pleasure." Nobly said, and no doubt truly too! *Salve, pater lexicographorum! Salve! Bene tibi et faustum sit, in paradiso lexicali!* This, in our view, is worth a thousand times more than all the groans, or whimperings, or outcries, of the great English lexicographer.

Dr. Robinson, as we opine, is much more nearly related to Passow than to Johnson. His work is clearly done *con amore*. No feeling short of this could have gone through such a labor.

This journal is not an appropriate place to go into any detail, with respect to many leading and highly important words in this new lexicon. A classical journal is the only appropriate place for such details. We can more usefully occupy the space allotted us, in giving our readers a brief view of some of the special difficulties that lie in the way of New Testament lexicography. They will then be better able to appreciate the labor that must be bestowed on such a production, in order to render it truly valuable.

Let it be remembered, that the ground-principle of all true

lexicography and interpretation is, that *a word means what the writer intended to designate by it.* The ground is here assumed, that every serious writer designs to be *understood* by his readers. Of course, he employs words according to their meaning as used by those for whom he writes. This is indispensable, in order to be rightly understood.

In such a case, where a writer employs his vernacular tongue, and belongs to the people whom he addresses, and is conversant, of course, with all the objects and manners and customs of that people, he finds no serious difficulty. His words merely suggest to the minds of his readers ideas with which they are familiar; and they, of course, readily understand the ideas and conceptions of the writer. So was it when a heathen Greek wrote for heathen Greeks; and so is it, when a native Englishman writes for Englishmen.

Very different from this is the state of the New Testament writings. Here two difficulties are presented at the threshold. First, the writer is a native Hebrew, and his vernacular is the later Hebrew. Secondly, he addresses, in the *Greek* language, men who are or were heathen, and whose former circle of thought, and knowledge, and language, was altogether Greek or heathen. In so doing, he endeavors to bring before them new objects and new doctrines or truths; and he also exhibits new modes of treating them, and of impressing them on his readers. By his Hebrew origin, a New Testament writer has become a Hebrew both in language and thought. When he undertakes to write in Greek, he necessarily brings along with him both Hebrew thoughts and idioms. These are foreign and strange to the heathen Greeks. And when he intermingles more or less of Hebrew idiom in his modes of expression in Greek, he is recognized at once as a foreigner, who has introduced into the vernacular Greek another element. This makes difficulty on the part both of writer and reader. *The language is a foreign one to the former; the things described are foreign to the latter.*

As we advance into this field and take a farther survey, we find our difficulties increasing. The Christian writer has a new revelation of pure and true religion to disclose, first of all to those who spoke the Greek, and afterwards, through them, to other nations. He has a religion to portray, which "had been hidden from ages and generations." And how can this be done?

No nation or people coin words before they are needed. There is no magazine or storehouse whence they are drawn on an exigency. The Greeks, who were polytheists and idolaters, spoke a language altogether appropriate to their religious condition and views. Their language of and by itself never designated, and, in fact, could not designate, any thing but ideas purely and merely heathen. But now a religion is to be disclosed, which, from its base to its topmost stone, so far as it is genuine and *distinctive* Christianity, is of a new material and new texture. Ideas must now be presented to heathen minds, to which they aforetime, and their language also, had been utter strangers. How could this be done?

Only in one of the following two ways. *The New Testament writers must either employ old words in a new sense,* that is, *one in a greater or less degree new, or else they must form new words.*

Of the latter we have but few examples, in comparison with the number of occasions for new words. Even these examples are not mere arbitrary formations, not new creations or productions of the locutive power in man. Nearly all such words are made by *composition;* that is, by uniting two or more original Greek words in one, in order to express ideas, or shades of ideas, which were unknown, or undesignated, in heathen Greek, or else to express ideas in a shorter or a more modified way, than that in which the classic Greek expressed them. For example: ταπεινοφροσύνη, *lowliness of mind, Christian humility,* which the Greeks not only did not express, but did not even recognize as a virtue. They called such a state of mind *pusillanimity,* and looked on it as opprobrious in any brave man. So μακροθυμία, *forbearance, long-suffering;* μεγαλωσύνη, *majesty,* especially *divine majesty;* and so in respect to some other like words. In regard to abridging and modifying words, the number of instances is not inconsiderable; for example, ὀρθρίζειν, λιθοβολεῖν, ἀγαθοεργεῖν, μοιχοποιεῖν; and so ὑποπόδιον, χρυσοδακτύλιος, αἱματεκχυσία, ἀλλοτριοεπίσκοπος, μονόφθαλμος, καιροποιεῖν, δικαιοκρισία, and the like; a pretty full list of which may be seen in Winer's New Testament grammar.

Kindred to this was the formation of words in a manner either new, (although normal,) or else the employment of old forms, grown obsolete in common written Greek. Thus we

have as new forms, *ὀπτασία* for *ὄψις*, *συγκυρία* for *συγχύρησις*, *βασίλευσα* for *βασιλεία*, etc.; and as examples of rare and uncommon words, not usually employed in the later classic Greek, *αὐθεντεῖν* *to govern*, *μεσονύκτιον* *midnight*, *ἀλάλητος* *unspeakable*, *βρέχειν* *to irrigate*, and the like; (see Winer, ut supra, § 2.) Both of these latter classes spring not from absolute necessity, but from the conceptions of those to whom Greek was a foreign language, and to whom, also, little knowledge of it belonged, (the case of Paul excepted,) saving that imparted by the *conversation dialect*. No doubt, many such words belonged to the vulgar spoken language, which are not recorded in the Greek books that have come down to us. Had we all the works of Aristophanes, our stores of popular diction would, through his comic dialogues, doubtless be much enlarged. We incline to believe, that in both these cases, the New Testament writers owe the forms of most such words to the *popular* Greek with which they were acquainted. But however that may be, it is undoubtedly true, that in all such cases as are concerned only with *varied forms*, there is little, if any, departure from the general sense of the classic forms. Such words can hardly come under our present category of *new formed words*; examples of which have already been given.

We stop not to inquire how it came about that the apostles took the liberty of forming new words, either by composition or in any other way. It lies on the very face of the matter, that in speaking of things entirely new to the Greeks, they must of necessity coin some new words. What could the chemist, or the botanist, or the zoölogist, or the geologist, of the present day, do without the liberty of forming and employing new words, appropriate to their respective sciences? But they might address the public as well, without using their *technics*, as the apostles could address the heathen Greeks on the subject of Christianity, without employing words necessary to designate new ideas.

But, secondly, *old words in a new sense* are the principal means employed in conveying new ideas to the Greeks. This is a principle admitted, and by necessity admitted, into all parts of the New Testament. It will strike almost with surprise any one not conversant with this matter, when he comes to be told of the extent to which this usage goes in the

New Testament. A little attention to the subject, however, will show, that nearly every thing peculiar and special in Christianity is designated by employing *old words in a new sense.*

Let us begin with θεός, *God*, the fountain and object of all true religion. What is θεός in a Greek classic? A deified man, half human and half superhuman and monstrous, a compound of power, and pride, and cruelty, and ambition, and tyranny, and lust, a being fraught with all human passions, especially the baser or the more destructive ones; a being local, limited in power, subject to the destinies, and destitute of holiness, justice, goodness, and truth. If Plato and Socrates, and some few others, like Eschylus or Pindar, attained to higher and somewhat more spiritual views, these had little or nothing to do with the mass. The gods of Homer's Iliad are those of the populace. And these, with the exception of *supremacy* in Jupiter alone, have not one moral or physiological quality of the God of the New Testament. They are neither omniscient, omnipotent, omnipresent, uncreated, eternal, or self-existent; they are not endowed with proper creative power; they are neither holy, nor just, nor all-wise, nor good. They are not even spiritual or incorporeal, but are formed of a kind of sublimated or transcendental substance. When, therefore, a New Testament writer appeals to the God of the Christians, or introduces him into any description or assertion, what idea could a heathen Greek affix in common with him to the word θεός? Not one thing is common to their minds, when this word is first introduced and read, excepting that of sovereignty or supreme power.

In what way, then, was the Greek to understand an apostle? In no way except by explanation, or by what is said respecting God in the context, and in other parts of Scripture. In these two ways, all knowledge of the apostles' meaning must be acquired. Rarely, if ever, do they stop to define words, for they take it for granted, the reader will sufficiently understand them by a diligent perusal of the context. In the present case, *supremacy* is the germ of the idea of θεός, and this is common to both parties; but the attributes and character of the Supreme Being are matters of inquiry, and of subsequent information to the Greek reader. Better was it to use this *germ* as a basis for development,

than to coin a word entirely new. Definition, immediate and formal, if it could be made, would not avail so effectually as further reading and consideration of the manner in which the Supreme is developed.

Having explained this leading word, designating the basis of all that is religious in the true sense, we may state the case of other leading and fundamental words in respect to the Christian religion more briefly. The Greek word ἄγγελος means simply *a messenger*; but in the New Testament this use of it occurs only some five or six times. The common use of it is to designate a purely spiritual subordinate being, (angel,) intermediate between God and man. Such are the *divine messengers*, in the view of the apostles; so that the accessory ideas attached to the word are two; first, that of a spiritual nature, and secondly, (in its common usage,) that of a holy being employed to execute divine commissions. To this whole order of beings the heathen Greeks were strangers. The true virtue of the word in the New Testament they were obliged to learn in the same way as that of θεός.

Then, again, we have *the devil's angels*. These are his *spiritual messengers to do evil*. Of such beings the Greeks knew nothing. Nay, the word διάβολος, *devil*, was, in their language, significant merely of a *calumniator*, who was not a spiritual or supernatural being. Of a spiritual enemy of God and man, a *primus inter pares* among evil angels or spirits, the Greeks had no idea. Their own gods were bad enough to furnish a satisfactory reason, by which one might account for all evil influences; and they never thought of such an order of beings as *evil angels*. They had indeed three *Furies*; but these were principally concerned with the infliction of madness and its consequences; and in general, their office was to be the ministers of the vengeance of the gods. Moreover, all of them were *females*; but we know of no distinction of sex among the biblical angels. Of course, a heathen Greek, in reading the New Testament, had to learn from the course of it what were the attributes and functions of the devil and all his angels.

Of the *spirits of the just made perfect*, the Greeks had no adequate or correct idea. *Holiness* was an attribute for which they had not even a proper name. The happiness of the *Christian heaven* was a thing of which they never

dreamed. Of a pûrely spiritual existence or being they had no conception. With them, πνεῦμα was *wind*, *air*, then *breath*, *respiration*, then (tropically) *spirited feeling*. Of proper spiritual beings even their philosophy had no conception. Their *ghosts* were merely of sublimated, airy, transcendental matter; and not unlike to this, were the forms of the gods themselves. All the happiness or sensations of their *Umbræ* were only airy and seeming things, without reality. Of course, every thing that pertained to the blessedness of the saints in heaven was utterly beyond their sphere of thought and language. All the New Testament ideas on these subjects they were obliged to learn *de novo*, from the various representations of that book.

Let us now go from personages to *places*. What was the Greek notion of *heaven?* In their language, οὐρανός meant *welkin* or *vaulted sky*. The edges of this vault rested on the verge of the earth; and through the centre of it, Mount Olympus shot up, and on its top, above the welkin, was the seat and heaven of the gods. In a more general sense, the word meant both the *air* and *sky;* but sometimes a particular region of the sky. But this was all. No great white throne; no angels or seraphim; no spirits of the just made perfect; no "waters of life;" no "trees whose leaves were for the healing of the nations;" no everlasting Sabbath; no songs of holy rapture. What an immeasurable distance lies between the two things! A converted Greek had to learn a new sense of the word *heaven*, as well as new views of those who dwelt there. The New Testament makes all this very plain.

As to the word *hell*, the heathen ᾅδης simply means *the invisible world*, *the grave*, *the infernal* or *lower regions*. In these were both good and bad. But the γέεννα of the New Testament is foreign to the Greeks. Dr. Robinson deduces, like most others, this word from the Hebrew גֵּי הִנֹּם but the proparoxytone accent makes against this; and De Wette and Paulus (on Matt. 5: 22) are decidedly of opinion that it is of foreign origin. With their views we coincide; for we do not see how ם·— (*om*) is converted into the Greek *a*. But be this as it may, the word stands for such a *hell* as the Greeks never dreamed of. They had to learn its meaning, as they learned that of the words named above.

Of *creation* as an act, that is, the bringing into being the material universe from nothing, no Greek dreamed. The words κτίσις and κτίζω had, in his mouth, a sense very diverse from that of the apostles.

So is it with *regeneration*. To be born of the Spirit, to be born of God, to be created anew in Christ Jesus, to be morally quickened or raised from spiritual death, were ideas as foreign to them in regard to the New Testament meaning, as the names of our technics in the recent arts would have been. All words employed to designate these things, as well as *sanctification* and *justification*, were employed by the apostles in a sense greatly diverse from that of the classic language. Even the word ἅγιος meant with them merely something devoted or consecrated to the gods. They had no ἁγιότης to designate *holiness*; and for the good reason, that they had never known or dreamed what *true Christian holiness* is. The readers of the New Testament found themselves called upon, therefore, to search out the new meanings of these words.

So is it with all the peculiar *Christian gifts* and *graces*. In classic Greek, δικαιοσύνη means *uprightness* merely; in the New Testament, in a multitude of cases, it designates the act or matter of *justification*, in the sense of acquittal or pardon. In classic Greek, πίστις means *trust* in others, *confidence*, or a means of *giving confidence* or *persuasion*; in the New Testament, there is mostly combined with this a special reliance on, or confidence in, the Lord Jesus Christ, as a *conditio sine qua non* of salvation. Χάρις, with the Greeks, meant *beauty of form, favor, kindness*; but Christianity has put a new emphasis on the word, when it speaks of the *saving grace* of God, and the *grace* of our Lord Jesus Christ. In short, there is no end to this catalogue of *modified* words and new senses affixed to them. Open the introduction to Winer's Grammar, and there may be found a great catalogue of them, which it is needless to repeat here. Enough has been said to make the reader fully aware on what new Greek ground he is treading, when he comes to the reading of the New Testament in the original.

We scruple not to lay down the broad position, that there is not a single important object, in heaven, earth, or hell, that belongs to the Christian system as such, which the

heathen Greek language, with its heathen meanings, could designate. The reason lies upon the surface. No language has words, which are the signs of ideas never entertained by those who use it. The heathen Greeks never had any ideas, either of objects, affections, or actions, appropriately and peculiarly *Christian*. How was it possible then to use their words, in their proper heathen senses, to designate things exclusively Christian? Nothing could be done, without giving a new sense to old words, or by the formation of new words. Any other way was plainly out of all question. Indeed, the thing is so plain that a very child can understand it.

Turn the tables for a moment. Suppose we were called upon to translate *guns*, *cannon*, *bombs*, *rockets*, *men-of-war*, *gunpowder*, *steamboat*, *electricity*, *magnetism*, and ten thousand other things, into Latin or Greek? Would not a Porson or a Hermann shrink at once from the attempt? The thing is impossible, simply because the Greeks and Romans, never having had any knowledge of these things, never formed any words to designate them.

Just so is it with Christianity. The heathen Greeks knew nothing of it, nothing of its special objects, operations, or graces. Of course, they never had formed any words, or used any words, to express these things. Inevitably, therefore, the apostles were obliged to do as they actually did; that is, to give new senses to old words, or to form in a normal manner new combinations of words, thus making essentially new words.

It lies on the very face of all this, that no apostle or evangelist could employ purely classical Greek in a classical way, in their communications. It is no good proof of Attic usage or style in the New Testament, that mere words found in Attic writers are found also in this book. Θεός is an Attic word; but how much of the Attic sense attached to the word belongs to the same word in Paul and John? We have already seen how this matter stands. *Style* is of course made up more of the *meaning* of words, than of their forms. But is there a paragraph in all the New Testament, which has not more or less words in it, that are employed in a sense different from that which the Attics attached to them? Certainly not one which treats of the peculiarities of the Christian religion.

This sole consideration, by the way, settles the great question, controverted in the fiercest manner among critics for more than a century, namely, — *whether the diction and style of the New Testament exhibit Attic purity.* Under the hands of some writers, it became an *articulus stantis vel cadentis ecclesiæ.* *Purism* was strongly contended for by Palairet, even so late as 1752. Salmasius wrote a book at an earlier period, which he entitled *Funus Linguæ Hellenisticæ*, in which he maintained, that the doctrine of a Hellenistic or Hebraistic style in the New Testament was dead and buried, and he came forward merely to celebrate its funeral obsequies. *Sed tempora mutantur.* *Purism* has now been dead and buried just about a century.

It is amazing how such a dispute could ever have existed. Evidently the apostles could not communicate their views to heathen Greeks, without attaching new senses to old words, or else forming new words. This, of itself, shows that strict *Atticism* was abandoned, and that from pure necessity. No other resource for communication was left but this. And there is evidence of it in every paragraph of the New Testament. If the words are Attic in form, the meaning of very many of them is not so.

Then why contend for *Attic purity?* Had its defenders gained the victory, they would have settled the question forever, in the mind of every critical inquirer, concerning the *genuineness* of the New Testament books; that is, they would have proved that they were *not* written by Hebrews, but by native Greeks. Consequently, as the authors profess to be *Hebrews*, the books would thus be shown to be spurious. No Hebrew, above all, none who had learned any thing of the Greek except its conversation-dialect, could write in pure Attic without a miracle. Even miraculous aid given to the writer could not have enabled him to accomplish this; for the heathen Greek is a perfect stranger to many Hebrew ideas, and therefore could not, without such expedients as are described above, be a medium of communicating new ideas, or of designating new objects. Thus the Purists, in their jealousy for the honor of the New Testament style, elevated the book with one hand and threw it down with two.

Such are some of the extravagances to which superstitious criticism may lead even renowned scholars and masterly lin-

guists. All Europe was agitated for three generations by the controversy. It has now been dead and buried as many more. But there are other questions, about as important as this, and about as easy to be settled, that are still agitated. The *allegorical* and *double sense*, the ὑπονοία concealed under the plainest language is still defended; and we can hardly look forward to a time, when the extravagances of an Origen and a Cocceius will cease to find defenders. Such facts are replete with grave matter for the consideration of the Christian churches. They teach us how earnestly men may contend for things as important and even necessary, which, if they are established, can do nothing but mischief both to criticism and religion.

From the views now given, it is easy to see what a work a New Testament lexicographer has before him. Without a thorough and correct understanding of this whole matter, he can make no headway. He must falter and stumble at nearly every step. All the modifications which the designation of Christian ideas demands, in words that are Greek, must be descried and defined by him. In order to make out these, the language and ideas of both the Greek and the Christian writers must be carefully compared. Dr. Robinson tells us, and no doubt truly, that this portion of his labor has cost him more time and toil than any other. (Preface, p. viii.) But he has done it to good purpose. Rarely will the reader find himself *sent to April* (as our cousins German say) when he consults him in respect to matters of this nature.

The work before us gives the etymology and original signification of each word. From the latter it deduces, in an orderly and logical manner, the derived or secondary meanings. The coloring given to words by their *adjuncts* is exhibited. In this way, the multiplicity of meanings in the word itself is very much diminished. Above all, regard is to be paid to this, in the case of verbs followed by prepositions, or of such as govern special cases. The derivations of forms, particularly of all irregular ones, is fully and accurately developed, as well as the distinctive and peculiar significations of different teases and voices. As a specimen of patient, well-arranged, and accurate labor, one may consult γίνομαι or ποιέω.

In regard to nouns, the development often possesses a high

logical interest. For example, δύναμις is given, first generically, namely, — *ability, power, might, strength.* Then follow two classes of power: (1) Innate or inherent *power*, whether physical or moral. (*a*) *Strength* of body. (*b*) *Vigor* or *force* in various objects or agents. (*c*) *Power* of God or Christ. (*d*) Miraculous *power*. (*e*) Essential *efficiency*. (2) Outward *power*. (*a*) *Authority* or *sovereignty*. (*b*) *Power* as to quantity, in *abundance*. (*c*) Warlike or hostile *power*. All these are illustrated and confirmed, by quotations from, and references to, the New Testament, the Septuagint, the Hebrews, and the Greek classics, *pro re nata*. So the word πνεῦμα may be consulted, where will be found one of the highest and most protracted efforts of the lexicographer; which we cannot transfer here, for want of room. Other specimens may be found under πίστις, δικαιοσύνη, and χάρις.

We have already described the difficulty that attends a full and accurate development of the particles, and the importance of such a development. Accordingly, we should expect to find Dr. Robinson exercising his iron diligence here, and our expectations are fully answered. We cannot extract, but we refer for samples to διά, ἐν, εἰς, κατά, παρά, πρός, σύν, δέ, μή, οὐ, etc. The article ὁ, ἡ, τό, is one of the most labored in the book, and with much success.

All parts of the book which present words of any difficulty have received careful revision and correction. Some have been enlarged, others compressed. On the whole, the book contains a considerable number of pages less than the preceding edition of 1836. But the quantity of real matter is much greater. Skill in abridging and compressing, without any sacrifice of perspicuity, has effected this. Pascal's excuse to his friend, who chided him for writing so long a letter, namely,— that "he had not time to write a shorter one," contains a deal of truth. Nothing but thorough knowledge and strenuous effort can accomplish brevity and perspicuity united. Dr. Robinson might probably have made two volumes like Schleusner's, with less of effort, if not of time, than he has written one.

We must not omit to add, that every difficult passage of the New Testament is handled *exegetically*. The lexicon of words is at the same time a *thesaurus* of the best interpretations.

In addition to all the rest, the publishers have done their part nobly. Fine paper, superb type, both Greek and English, good ink, and a fine impression, constitute the beautiful costume of this work, so honorable to the author and his country. We are not fond of boasting; much less at the expense of the reputation of our venerable mother beyond the Atlantic. But we may, with all due respect, ask her, where are the New Testament lexicons of Oxford or of Cambridge, that will bear comparison with this? Greek scholars they have in abundance. They can lecture on Greek tragedies, and, it may be, on Greek historians, to some good purpose. But we are not aware of much which is important that has been done by them for a century past, in the way of promoting the true critical knowledge of the Scriptures. It would seem, that a large class of men, set apart for the service of the church and of sacred literature, and maintained at a most princely expense, ought to repay a munificent public by something that would keep adequate pace with the sacred philological progress of the present day. They have given us, indeed, a Parkhurst's Lexicon, and a Taber on the Prophecies, and a Birks on Daniel, and an Eliot on the Revelation, and some other productions of the like calibre and stamp. What real advances can a thousand such writers make, in solid, profitable, sacred literature?

One thing, however, they may do. As before, they may republish three or more editions of Dr. Robinson's work, besides several emasculated abridgments; and the first of these, even if the author is obliged to forego all remuneration, and has his own market straitened at home, we should be glad to see; for it would be the harbinger of a brighter day in sacred criticism among the English people. We hope the mother will not take offence at this freedom in her daughter, nor call to mind the days when this daughter was somewhat saucy and unmanageable. She has now grown to an age of some maturity, perhaps in judgment and learning, as well as in years, and can venture to speak a little more freely than in days that are past. But with all her pride and self-sufficiency and proneness to glorying, and with all her republicanism, too, she does boast, and will boast, and glory in it too, that she has the *noblest descent* of any nation on the face

of the whole earth. Let each provoke the other to love and good works; and the further the rivalry goes, the better for themselves and the world at large.

Of course, a book like that of Dr. Robinson's, which comprises such an infinite variety of topics, philological, critical, exegetical, moral, and religious, must needs have some faults. In the many leading articles that we have examined, however, we have found none worth noting here. Undoubtedly, with respect to the exegesis of some passages, there is room for variety of opinion. We might not agree with Dr. Robinson, as to the turn given to this difficult text or to that. But he does not claim that we are bound to accord with him. He only claims the right of giving his own opinion, and generally with the reasons for it. When we differ, we are bound at least to thank him for giving us what is said and thought by others, or by himself; and this is no unimportant service. He is no dogmatist; nor is he of the *neuter gender* in philology, criticism, or theology, so far as the latter has to do with a lexicon. But his decisiveness makes him neither overbearing nor obstinate. Even in case we are compelled to differ from him in opinion, we are pleased to see that he has an opinion of his own. The *aspectus bifrons*, which we so often get sight of in Schleusner and Wahl, has no place here. The *Umhüllung* so often employed by them, in relation to certain topics and things, is never employed, or at least is successfully kept from view, by Dr. Robinson. We may differ from him without the fear of any forthcoming anathema. But thorough adepts in philology and exegesis will not often find occasion to differ; and when they do, the case will be one on which something may be fairly said on both sides. Positiveness here would not be quite becoming.

What has been said above will serve, as we think, to convince every candid mind of the importance of a separate New Testament lexicon. How would it be possible, even in such an extended work as that of Liddell and Scott, to give all the light and shade of New Testament words? Above all, how could a classical lexicographer afford room for biblical history, biography, geography, antiquities, and the like; and especially, how could he make such a work a *thesaurus* of New Testament interpretations? Hence the all but worthlessness of common lexicons, for a critical reader of the New

Testament Greek. What has been already said will show every one the reason and ground of this. But a lexicon like that before us will enable the student in a good measure to dispense with the commentators. Indeed, it is beyond comparison the best way of studying the New Testament, to confine one's self to a good grammar and lexicon, until all the light which these afford, and all which one's own reflections may supply, appear to be insufficient for satisfaction. But always let one's own efforts be exhausted, before he applies for aid, when he has time to devote himself to thorough study. Commentaries are made for exigencies, and to save time in case of pressure. He who means to stand on his own basis, must render himself as independent of them as he can. A deep study of idiom, in the way of using grammar and lexicon, is the high road, and the only one, to real independence. In due time, lexicon and grammar may be nearly dispensed with, and a good *concordance* will be worth all the lexicons in the world. It is one excellence of Dr. Robinson's book, that it serves nearly all the purposes of a concordance, as well as those of a lexicon.

We are somewhat apprehensive, that some readers of this journal may think so long a review of such a book is out of place here. But the importance of the subject, and of the principles which are discussed, will apologize, as we hope, for this length. At all events, we believe that a Christian public will not do otherwise than thank us for bringing before them the merits of a work adapted to afford most important aid in studying the original records of our faith. It is a book that all religious parties may use in common; and if they are not always guided by its decisions in certain cases, this will not hinder the profit resulting from the use of the book in general. It is not the work of a sectarian, but of a genuine philologist. We repeat, that it is an honor to our sacred literature and to our country.

ART. II. — *The Seven Lamps of Architecture.* By JOHN RUSKIN, Author of "Modern Painters." With Illustrations drawn and etched by the Author. New York: John Wiley. 1849. 12mo. pp. 186.

LIKE the other fine arts, architecture is a spontaneous product of a cultivated mind; one of the fruits of our spiritual nature, one of the privileges of our birthright. In the edifices which man builds for his own habitation, or for national uses, or for the ceremonies of religion, he aims at something beyond mere convenience and utility, even at the expression of ideas of beauty and grandeur, something that will contribute to his joy, will elevate and dignify him, and serve as a fit representative of his hopes and belief. Like the other arts, this attends the course of a nation's power and intelligence, and forms (as we shall see hereafter) one of the most striking and important indications of its condition. In one view, it is the most practical of the arts, being so closely connected with the comfort and convenience of man, and requiring the most practical skill in order to realize its ideas. In another, it is the most ideal, since it finds in nature few or no models, — in its ornaments even, borrowing from nature the elements rather than the perfect shape. In its grander forms, it is immeasurably more vast than the sister arts, and demands the aid of national resources to complete its designs; but then it repays this aid by bearing most public and permanent witness to the liberality of its authors, defying for ages the power of the elements, and bearing down from one generation to another the name and fame of its builders, mysteriously uniting different centuries, ever awakening our profoundest meditations, and contributing (how much!) to our moral sensibilities.

Like the other arts, it has its schools and its orders. Considered as the representative of religious ideas, it has been divided into the two great classes of heathen and Christian; or, using those terms which designate its most important schools, Grecian and Gothic. Sometimes it assumes a national nomenclature, as Egyptian, or Grecian, or Moorish, or Italian. These, too, are subdivided according to the peculiarities of some prominent member, as the column or the arch; and we have the Doric order, with its short columns and

massive simplicity; the Ionic, with lighter columns and the graceful volute of its capitals; and the Corinthian, with pillars still more slender, crowned with the gorgeous acanthus. The Gothic, too, though not divided into orders, like the Grecian, still has its flat arch and its pointed arch, and many other peculiarities, by which the patient student determines when and by whom the structure was raised.

Of the different kinds of architecture, there are some general characteristics which may be easily recognized, even though the ideas which they express are not distinctly before the mind. Every nation whose architecture is living, has originated that which gives it peculiarity. To the Egyptian belongs the pyramid and the obelisk, — the latter a slender monolith, with its vertical line of hieroglyphics, — the former, a vast pile, expressive, both by its shape and bulk, of simple weight and stability. Their temples suggest, as the most prominent ideas, permanence and mystery. Obelisks, with their undeciphered hieroglyphics, and sphinxes, with their placid, enigmatic countenances, guard the sepulchral doors; no window pierces the massive walls; the whole is like a prison or a tomb. The Greek, though borrowing his arts as well as his letters from Egypt, knew how to endue them with a fresh and exquisite form, and breathe into them the breath of a new life. Around the solid cell of the temple he raised the light and airy colonnade; upon the pediment he erected statues of gods and heroes; along the frieze he stretched the fabled Centaurs and Lapithæ, and beneath it hung the shields of those who had returned victorious from battle. There was little of the seclusion and mystery of the Egyptian. Nothing that art could do, working upon the patriotic memories of the people, or their present renown, or their love of the beautiful, or their religious instincts, was omitted to render the temple the centre of every affection, the emblem of the mind and heart of the nation. Every part of the Grecian edifice has a relation to the whole, and is instinct with life. Nothing is superfluous or unfit. The unbroken horizontal line of the long entablature at once catches the eye, and gives the impression of stability and weight, to which the abundant columns are ever opposing their sufficient support; so that it delights us with the tranquil harmony of its expression, so simple as to be easily comprehended, so perfect in beauty as

never to weary the eye, never grow old to the mind. Its workmen wrought with exquisite skill; the stones were united with the most beautiful accuracy; and even at this distance of time, a new principle is every now and then discovered to attest both the profound knowledge and the delicate practice of the marvellous builders.

The Greek style was carried by Greek artists to Italy, Sicily, and the south of France. At Pæstum, a day's journey south of Naples, was erected the magnificent temple to Neptune, which now, thousands of years since it was built, forms, in the solitude of the deserted campagna, one of the most impressive memorials which Italy contains. At Nismes, in the south of France, are carefully cherished, are even used, at this day, the temples and amphitheatres which Greeks and Romans built. The Romans were destitute of the requisite material in which Attica abounded; there was no Pentelicus near Rome; hence, had their genius equalled that of the Greeks, they could not easily have rivalled their structures. They built sometimes of brick, oftener of stone; but their purposes were different from those of the Greeks, and they produced different effects. They needed not only the temple with its narrow *adytum*, but the vaster enclosure, in which half the population of the city might, if necessary, congregate. Then rose their amphitheatre, with columns and arches tier above tier, and its corridors with their vanishing curves, and the vast oval of its interior, and its retreating circles of seats on which a hundred thousand could sit, and from which all could depart without jostling or delaying each other. Then rose the vast expanse of the Pantheon, whose beautiful dome now hangs over the statues of saints, as once it overhung the shrines of all the gods to whom Agrippa, twenty-seven years B. C., devoted it. To show how well they built, with what a grand purpose too, with what an idea of the permanent nature of their work, it may be remembered that the original bronze doors still swing upon the hinges where they were hung one thousand eight hundred and seventy-seven years ago, and every stone remains as the architect placed it, though Constantine II. carried its tiles of gilded bronze to Constantinople in 663, and Pope Urban VIII., in the seventeenth century, took 45,000 pounds of bronze from its portico.

With the prevalence of Christianity and the changed con-

dition of society, another change came over architecture. The ceremonies of religion could be performed only within an enclosure entirely protected. The structure began to be emblematic of the faith; the church expanded in the form of the cross, a form not only fit as an emblem, but admirably adapted to architectural effect, (especially interior effects, which now came to be carefully considered,) and equally fitted to the convenience of worship. The extended open space at the meeting of the arms of the cross naturally suggested, especially to people living much in the open air, the idea of an elevated expanse. "I will hang the dome of the Pantheon," said M. Angelo, "in mid-heaven." Brunelleschi, the architect of Santa Maria at Florence, had already done something like it. In obedience to the word, rose the dome of St. Peter, fretted and blazing within, like the vault of heaven, and shedding down, through the numerous windows in the dome, a flood of light upon the crowd beneath, the images of saints, and the mosaic pictures. Beside the cathedral, also, in many places rose the campanile, a belfry tower, two of which especially, the leaning tower at Pisa and the campanile of Giotto at Florence, are famous as wonders of the world. Then, too, was sometimes added the *baptistery*, with its marble fonts. About the same time, the domestic and civil architecture assumed a permanent form. Palaces, dark, sombre, and frowning, strong as fortresses, yet grand and magnificent as the residence of princes, adorned and dignified the cities, while the hills were crowned with castles.

In the mean time, the northern countries, whose severer climate, by depriving their inhabitants of the free life of the south, made them more meditative, and cultivated their romantic tastes; whose position, too, removed from the centres of the eastern and the western empires, made them more independent, and gave a chance for original products, gave birth to that complicated, vast, and various style of architecture which we generally term Gothic. Here are no remains of the Greek; no long horizontal lines; no dark enclosed cell; no clear daylight exterior, faultless in its simple proportions; but a wonderful and intricate pile, shooting heavenward in countless pinnacles, its main spires rising to the utmost limit of architectural skill and daring, its exterior supported with solid or flying buttresses, to resist the horizontal pressure of the

massive roof, and ornamented with a profusion of pinnacles and statues, and grotesque figures, and delicate fret-work, — its interior open to the highest point of the roof. The "garish eye of day" shut out, and with it the noise of the outer world, a "dim religious light" streaming down from "stained windows richly dight" — every thing calling the mind to contemplation, to reserve, to worship.

"'The cathedral,' says an eloquent writer, 'is to be considered rather as a forethought than as a finished specimen. It exhibits the effort that has been made to embody those abstract ideas of solemnity and grandeur, which could not be fully realized or accomplished by human power. Still the effect has not failed. Gothic architecture appeals to the imagination, and fancy half supplies the deficiencies of the material scene. A Gothic building has always the charm of mystery; it always appears to be larger than its actual dimensions. The mouldings, the pillars, the arches, always create receding shadows; and to the mind the idea of space arises from a succession of shadows, just as a conception of time results from the succession of ideas. In the earlier Gothic styles, the management of the aërial tints was studied with remarkable skill. . . . . The Gothic style always fills the eye, and conveys the notion of comprehension and capacity. Habitation, and converse, and congregational worship beneath its roof, are seen to be its intent. We are invited to enter into the cathedral. The portals expand, and in the long perspective which appears between the pillars of the porch, and ends in the distant choir, the light darts downwards through the lofty unseen windows, each marked by its slanting beam of luminous haze, chequering the pillars and the pavement, and forming a translucent gloom. Gothic architecture is an organic whole, bearing within it a living, vegetating germ. Its parts and lines are linked and united; they spring and grow out of each other. Its essence is the curve, which in the physical world is the token of life or organized matter, just as the straight line indicates death or inorganized matter. It is a combination of arches, whose circles may be infinitely folded, multiplied, and embraced. Hence the parts of a Gothic building may be expanded indefinitely, without destroying its unity. However multiplied and combined, they still retain their relative bearing; however repeated, they never encumber each other. All the arched openings, the tall mullioned windows, the recessed doors, are essential parts; they do not pierce the walls of the structure; on the contrary, they bind them together. The spire may rise aloft, the large and massy walls may lengthen along the soil; but still the building preserves its consistency.

Richness of decorations, color and gold, may increase the effect of the Gothic style; but the inventor chiefly relies upon his art and science. Gravitation, which could bring the stone to the ground, is the power which fixes it in the archivolt, and every pinnacle bears witness to the mastery which the architect has gained. Frequently the details are bad. Parts considered by themselves are often destitute of beauty; but they are always relevant, and all minor faults are lost in the merits of the entirety. The history of the style accounts for its propriety, its chiefest merit. Gothic architecture, whatever its primitive elements may have been, was created in the northern parts of Europe; it was there adapted to the wants of a more inclement sky. Its structures were destined for the religious worship of the people amongst whom it was matured. In a Gothic church, no idea can possibly arise save that of Christianity and of the rites of Christianity. We cannot desecrate it even in thought. From its mode of construction, no convenience which we need, ever becomes a blemish, and its character assimilates itself to every emblem or ornament which its use requires." *London Quarterly Review, July*, 1822.

No style of architecture is, therefore, so free as this; none other admits of such elaborate and fanciful detail. The most luxuriant fancy of the architect had the fullest scope, the grand religious impression of the whole fearlessly authorizing accessaries the most various and peculiar. And who were the architects? We do not know that there has come down to us the name of a single builder of any of the hundreds of churches which rise all over Germany, and the northern part of France, and Belgium, and England, in such variety, (no two being alike,) and with such indubitable evidence of the genius and skill of their authors. Perhaps they were conceived and planned by ecclesiastics, whose life was so swallowed up in that of the church they served, that their names and individual existence were thought of little consequence. They received their reward in the very processes and effects of their art. It is probable that these structures were built, not unfrequently, by the guilds of masons, which, we know, existed in almost every country during the middle ages, and who had their secret craft and enjoyed particular privileges. However that may be, they built with an amazing economy of time and expense, and a large exhibition of manual skill and mechanical knowledge. Still, centuries were sometimes re-

quired for completing the works which they began in faith, and carried on in love. Many are yet unfinished. There was a fine sentiment, as it seems to us, in leaving, on the incomplete tower of the cathedral at Cologne, the crane with which the stones were raised, and renewing it when it decayed, that it might ever stand as a mute prophet of unfulfilled purpose.

It is almost as impossible to exaggerate the beauty of many of these structures, as it is to conceive their various effects, viewed in all the conditions each one is capable of; from below and above, when the sunlight of morning is creeping down, or the sunlight of evening is creeping up, the spire; or within, where great masses of light and of shade meet and mingle, and overwhelm the observer with a sense of vastness, and thought, and mysterious, solemn beauty. To erect a structure of lath and plaster, which becomes superannuated at fifty years, which every wind of heaven makes creak and shiver, is excusable for those who must build something, and cannot afford to build any thing better; but we cannot expect the full effect of architecture in such an edifice, nor should we blame the art or judge it harshly, if we fail to receive from it the expected lesson.

Yet we need not look for nor resort to any recondite argument to show the power of this art. What traveller has not garnered up, among the most precious treasures of his memory, the hours when first he saw some of those grand relics of former labors? — the hour when, entering the Porta Cavallegieri at midnight, a full moon throwing its silver light over roof, and spire, and dome, he found himself, all unawares, before the circling colonnade of St. Peter's? or when, wandering he knew not where, through the grass-grown streets of the silent city, he suddenly stood before the majestic front, beneath the frowning cornices, of the Farnese Palace? or when for the first time he rested upon the upper seats of the Coliseum, or wandered through its vaulted passages? or paused in the great quadrangle of the Ducal Palace at Venice? or heard, at gray twilight, the receding echoes in the baptistery at Pisa? or looked upon the dim old pictures in the Campo Santo? Can he forget the hour, when, fresh from the new world, he stood before the vast and wonderful front of the cathedral at Rouen? or, when, journeying homeward, sated

and wearied with a lengthened pilgrimage, having all day skirted the borders of the Black Forest, he saw from far the beautiful spire of the minster of Freyburg, and hastened to repose beneath the grateful shadow of its walls? If he can, then may he better have plodded and dug at home. History, for him, has no grandeur; art, no glories.

Perhaps no work of man awakens so strong a sympathy with the past — a sympathy with our race, indeed, and a wise meditation — as a building, which for hundreds of years has received the successive generations of men; has looked down on their business, their sufferings, their glory, and seen it all pass away. The earth is old, but its age does not affect us so strongly, for it shows few signs of age; it renews itself every year, and is constantly changed by the active energy of man. Our eyes do not see the same world that our fathers looked on, or else it is so much the same that we forget the time that has rolled away. Hence, too, of different buildings, one produces a stronger effect than another; the ruins of the Parthenon, where art lavished her powers, than the pyramids, older, by far, but less touched by time, and less capable of indicating its ravages. We have sometimes thought that, in connection with any public institution, especially an institution for education, a really fine building, standing age after age, as a kind of visible representative of the spirit of the place, the *religio loci*, is a more valuable education of the finer sensibilities, and of temperate and just thought, than books or teachers. Especially would this power be felt, as a country grew older, and could look back to a long line of distinguished men; and, every college would gather up the name and fame of its alumni, as its choice treasures. To remember the great and good, who once walked along these aisles and toiled in those chambers, does something to fortify one against indolence, something to prompt him to good resolutions and earnest labor. Charles Lamb refers beautifully to this intangible, and somewhat indefinite, but strong effect, in his Recollections of Christ's Hospital, when speaking of the tone of character imparted to the boy by "the antiquity and regality of the foundation to which he belongs; by his old and awful cloisters, with their traditions: by his spacious school-rooms; by his stately dining-hall, hung round with pictures by Verrio and Lely;" by the

remembrances which went back to the very founder, "that godly and royal child, King Edward VI., the flower of the Tudor name — the young flower that was untimely cropped, as it began to fill our land with its early odors — the boy-patron of boys — the serious and holy child, who walked with Cranmer and Ridley, fit associate, in those tender years, for the bishops and future martyrs of the church, to receive or (as occasion sometimes proved) to give instruction." Should we not, therefore, look with more favor upon efforts for the construction of an edifice in connection with a public institution, where architectural skill and taste might find full scope, than upon the erection of plain, if not unsightly dormitories, except, indeed, so far as these last are absolutely required? Should we not build, too, upon the best plan and in the best way, so far as the means will allow, and then wait for a future day to complete the design?

Thus far, we have spoken rather loosely of the prominent styles and general effects of this earliest of the constructive arts. But the question arises, whether there are not certain laws derivable from the nature of the mind, from the very character of that intellectual delight and profit which the art affords, — certain principles, which must have lain in the minds of the great builders and given birth to their works, which will enable us to understand their merits, and which, when felt, will be the best assurance of excellent products in their art hereafter. To answer these questions, and to exhibit some of these "laws which are based upon man's nature, not upon his knowledge," is the object of the volume whose title we have placed at the head of our article; a volume which, we acknowledge, has bound us with a spell too strong to be easily broken, and too delightful to be resisted. If it sometimes attenuates the thought beyond our power to follow it; if it stretches a point to carry out a preconceived notion; if even it occasionally substitutes imagination for fact, — to prove which, however, would require an observation as accurate and an affection as true as its author everywhere exhibits, but which certain unaccountable heresies in the "Modern Painters" might lead us to anticipate, — all is amply atoned for by the generous and noble thoughts, the delicacy, the beauty and truth, so elegantly exhibited and enforced, as well as by the glory thrown over the grand art itself by

speculations so subtle, yet so large. Whether its technical distinctions be true or false, its nomenclature philosophical or otherwise, matters little, compared with the refining and elevating influence it must exercise upon the public taste. It has a worth beyond and above the power of technicalities, and will touch with joy many a heart to which *cusp* and *mullion*, *transept* and *apse*, are little better than words of a barbarian; many to whom, from want of opportunity or of study, the pages of minute and learned criticism will be of the least value or interest. And so far as our own country is concerned, we think it of much importance to give a wise direction to the awakening taste. One need not travel far to become convinced of the increasing interest taken in architecture, both public and domestic. In our quiet villages, there have risen many a tower and spire, such as, in spite of the frail material of which they are built, it does us good to look upon; such as it is a joy and blessing even to pass near in our daily ways and walks; such as it brings the light into the eyes to see from far, lifting their fair heights above the crowd of humble roofs. That there has been much that is extravagant, and fantastical, and in bad taste, we know too well; but in many of these abortive attempts, we are not slow to discover the germ of something better; at least the aspiring mind, dissatisfied with the present, and earnest for the future, ready for instruction, and grateful for it when bestowed.

It has been far enough from our purpose to give a dissertation on architecture. We would rather direct our readers to a brief analysis of the volume of Mr. Ruskin, although we are aware how dry and unsatisfactory is an abstract of a work in which the imagination plays a part so conspicuous. To exhibit the ideas of the author, it will fortunately be necessary to quote liberally from the book itself, and to use its phrases even where it would be difficult to acknowledge them.

The first of these guiding principles, which are dignified by the attractive but obscure name of "Lamps of Architecture," is the *Spirit of Sacrifice*. "Architecture," says Mr. Ruskin, "is the art which so disposes and adorns the edifices raised by man, for whatsoever uses, that the sight of them contributes to his mental health, power, and pleasure." It is distinguished from building, because that has reference merely to the con-

venience and comfort of a structure, and its general fitness to the practical end for which it is designed. Architecture concerns those characteristics of an edifice which are above or beyond its common use. It may be arranged under five heads, according to the purposes to which buildings are devoted, — devotional, memorial, civil, military, and domestic.

With respect to all these kinds, but particularly to devotional and memorial architecture, the spirit of sacrifice, (to state the idea as strongly as possible,) offers such things "as are precious simply because they are precious, not because they are useful or necessary." "Of two marbles, for instance, equally beautiful and durable, it chooses the more costly, because it is so; and of two kinds of decoration equally effective, it would choose the more elaborate, because it was so, in order that it might, in the same compass, present more cost and more thought." This is the opposite of the feeling, which, with true commercial sagacity, seeks to produce the most at the cheapest rate; but it is the feeling which has prevailed whenever and wherever art has produced its noblest products, — a feeling similar to that which prompted David *not* to accept the threshing-floor and oxen of Araunah as a gift, but to buy it. "Neither will I offer burnt-offerings unto the Lord my God of that which doth cost me nothing."

This idea the author finds developed and illustrated in the ancient Jewish services as ordained by God: in the blue and purple and scarlet hangings; the brass and silver and gold of the tabernacle and the temple; and this, notwithstanding the danger that a sensuous people would be led by this external splendor — certainly were in imminent danger of being led — to idolatry.

"Yet against this mortal danger provision was not made in one way, (to man's thoughts the simplest, the most natural, the most effective,) by withdrawing from the worship of the Divine Being whatever could delight the sense, or shape the imagination, or limit the idea of Deity to place. This one way God refused, demanding for himself such honors, and accepting for himself such local dwelling, as had been paid and dedicated to idol gods by heathen worshippers; and for what reason? Was the glory of the tabernacle necessary to set forth or image his divine glory to the minds of his people? What! purple or scarlet necessary to the people who had seen the great river of Egypt run scarlet to the sea, under his condemnation? What! golden lamp and

cherub necessary for those who had seen the fires of heaven falling like a mantle on Mount Sinai, and its golden courts opened to receive their mortal lawgiver? What! silver clasp and fillet necessary, when they had seen the silver waves of the Red Sea clasp in their arched hollows the corpses of the horse and his rider? Nay — not so. There was but one reason, and that an eternal one; that as the covenant that He made with men was accompanied with some external sign of its continuance, and of his remembrance of it, so the acceptance of that covenant might be marked and signified by use, in some external sign of their love and obedience, and surrender of themselves and theirs to his will; and that their gratitude to him, and continual remembrance of him, might have at once their expression and their enduring testimony in the presentation to him, not only of the firstlings of the herd and fold, not only of the fruits of the earth and the tithe of time, but of all treasures of wisdom and beauty; of the thought that invents, and the hand that labors; of wealth of wood, and weight of stone; of the strength of iron, and of the light of gold."

It was this spirit of ready and generous contribution, of patient and affectionate labor, which raised, in other days, structures whose costliness, however great, was but their smallest praise; the spirit which found its satisfaction in giving to an object of general love, and which received back the rich recompense of him who gives not grudgingly, but cheerfully. "Do not think the feeling a folly, or the act itself useless. Of what use was that dearly bought water of the well of Bethlehem, with which the King of Israel slaked the dust of Adullam? Yet was not this better than if he had drunk it? Of what use was that passionate act of Christian sacrifice, against which, first uttered by the false tongue, the very objection we would now conquer took a sullen tone forever?"*

Religion may not need the arts, but the arts need the exalting influence of religion; to its service, in order to flourish most, they must be devoted "by both architect and employer; by the one, in scrupulous, earnest, affectionate design; by the other, in expenditure at least more frank, less calculating, than that which he would admit in the indulgence of his own private feelings." The sacrifice of which the author speaks is by no means of money merely, but of mind, of long thought,

* Why was not this ointment sold for three hundred pence, and given to the poor? — John xii. 5.

of the fulness of intellectual strength; not the spirit which lets itself out for hire, but which, without recompense, finds its chief joy in the ideal perfection of its work; the spirit of Michael Angelo, when he undertook the building of St. Peter's for the honor of God, and with an express stipulation that he should receive no pay; which made Haydn (to draw an illustration from another art) inscribe on the paper when he sat down to compose his greatest works, *Soli Deo gloria;* which leads the workman on the cornice or the frieze, which not one eye in ten thousand will notice, to be as careful and conscientious as if every thing depended on him. This spirit evidently will secure the full power of the artist's mind upon the work. He will do his best; he will not work beneath his strength. This it is which is so beautiful to see in the structures which excite the most affectionate admiration. The closer the examination, the fresher, the more numerous, the more delicate, the more surprising the beauties which we detect. The wonderful exuberance of the carving; the immense multiplication of the figures, not always done well, but done with a good will, with painstaking, with love; the delicate lines carried up to the very top of the spire, beyond the reach of any eye but his who would climb to see them, — all attest the care that nothing should be slighted; all show the faith and zeal of the times.

"Those fair fronts of variegated mosaic, charged with wild fancies and dark hosts of imagery, thicker and quainter than ever filled the depth of midsummer dream; those vaulted gates, trellised with close leaves; those window-labyrinths of twisted tracery and starry light; those misty masses of multitudinous pinnacles and diademed tower, are the only witnesses, perhaps, that remain to us of the faith and fear of nations. All else, for which the builders sacrificed, has passed away; all their living interests, and aims, and achievements. We know not for what they labored, and we see no evidence of their reward, victory, wealth, authority, happiness; — all have departed, though bought by many a bitter sacrifice. But of them and their life and their toil upon the earth, one reward, one evidence, is left to us in those gray heaps of deep-wrought stone. They have taken with them to the grave their powers, their honor, and their errors; but they have left us their adoration." p. 24.

From the Lamp of Sacrifice we pass to *The Lamp of Truth.* This principle requires the avoidance of all archi-

tectural deceit. As moral truth lies at the foundation of every valuable character; as, too, we feel the injury, not only of open falsehood, which we may detect and crush, but still more perhaps of the habit of careless untruthfulness, through which we gradually become indifferent to the beauty and glory of truth itself; so in art, the true dignity of it advances and declines as this principle is remembered or forgotten. Conscientiousness must be a quality of the artist as truly as any intellectual or mechanical skill; and pretence, concealment, and deceit are to be as much avoided in building as in every thing else. Although this general rule will hold, there is, as a little reflection will show, considerable delicacy and difficulty in its application, the same appliances in different situations producing different effects. Nobody imagines the gilded picture-frame to be gold; but a gilded ornament in jewelry at once offends as an imposition. Whitewash upon the walls shows what it is; we understand its purposes; but if wood by the side of the whitened stone be whitewashed so as to deceive us, it becomes, to a certain extent, offensive. A painted wall may be perfectly proper, indeed, indispensable to neatness and propriety; but it may be a perpetual lie, forever mocking the eye, and as soon as detected, degrading the whole structure, taking away from what is real its beauty, by throwing suspicion upon it. A carved frame pleases us in proportion to the skill and beauty and difficulty of the work; but a frame with moulded ornaments, a mere mechanical work, cheapens and vilifies every similar thing we set eyes on, whose honest and substantial excellence we cannot at once detect. Diamonds themselves are cheapened by paste.

The evil of architectural deceptions is considered by the author under three heads. 1. "The suggestion of a mode of structure or support, other than the true one; as in the pendants of late Gothic roofs." 2. "The painting of surfaces to represent some other material than that of which they actually consist, (as in the marbling of wood,) or the deceptive representation of sculptured ornament upon them." 3. "The use of cast or machine-made ornaments of any kind. Now it may be broadly stated, that architecture will be noble exactly in the degree in which all these false expedients are avoided."

Omitting the first of these heads, as less easily illustrated,

let us look a moment at the second, — surface-deceits. The most reprehensible of these is the false representation of material, as of wood turned into marble or granite, and yet in a score of ways betraying the deception. Any such imitation of a precious or costly material may be tolerated, perhaps, in a cheap structure, where it is perfectly innocent of giving any higher impression than that of a tolerable or a vile imitation; but introduce it into architecture of a high rank, a structure of cost and beauty, and how it dishonors the whole! Especially is this painful in churches, where every thing ought to be true, above disguises, above falsehood. A plainly colored wall, whose mild tint will not dazzle the eye, is far to be preferred to the so-called fresco architectural paintings, which are forever puzzling us to detect what is true and what is false, or making us wonder at the singular freak of nature, which casts the shadows in the very face of the sun. We do hope that this detestable method of ornamenting, or rather of disfiguring, our churches has had its day. Arches, and columns, and vistas behind the pulpit are bad on every account. As mere architectural drawings, they are false and painful to every eye but the one in the proper point of vision; while to every just mind they appear generally as a glaring absurdity, and always as a perplexing and distracting deceit. But this may not be thought a matter of much consequence —

"Perhaps not to religion (though I cannot but believe that there are many to whom, as to myself, such things are serious obstacles to the repose of mind and temper which should precede devotional exercises); but to the general tone of our judgment and feeling — yes; for assuredly we shall regard with tolerance, if not with affection, whatever forms of material things we have been in the habit of associating with our worship, and be little prepared to detect or blame hypocrisy, meanness, and disguise in other kinds of decoration, when we suffer objects belonging to the most solemn of all services to be tricked out in a fashion so fictitious and unseemly." p. 41.

And afterwards, on the subject of false ornament, the author goes on to say with a pardonable vehemence: —

"Exactly as a woman of feeling would not wear false jewels, so would a builder of honor disdain false ornaments. The using of them is just as downright and inexcusable a lie. You use that which pretends to a worth it has not; which pretends to have a

cost, and to be, what it did not, and is not; it is an imposition, a vulgarity, an impertinence, and a sin. Down with it to the ground, grind it to powder, leave its ragged place upon the wall rather; you have not paid for it, you have no business with it, you do not want it. Nobody wants ornaments in this world, but everybody wants integrity. All the fair devices that ever were fancied are not worth a lie. Leave your walls as bare as a planed board, or build them of baked mud or chopped straw, if need be; but do not rough-cast them with falsehood." p. 45.

There is not time to indicate here, how far the general principle is applicable to structures, which, instead of being thoroughly what they seem, are only *veneerings* of stone, the mass of the wall being of some cheaper material; or which lift a bold front of stone, while the body of brick retreats and hides itself, as well as it can, from observation. Nor yet can another and broader application of the principle be more than noticed, — namely, that every order of architecture has its laws, and exhibits certain effects; and when, for any reason, it forsakes these, it becomes untrue to itself and begins to decline.

"So fell the great dynasty of the mediæval architecture. It was because it had lost its own strength, and disobeyed its own laws, — because its order, and consistency, and organization had been broken through, so that it could oppose no resistance to the rush of overwhelming innovation." "It was not the robber, not the fanatic, not the blasphemer, who *sealed* the destruction that they had wrought; the war, the wrath, the terror, might have worked their worst, and the strong walls would have risen, and the light pillars would have started again from under the hand of the destroyer. But they could not rise out of the ruins of their own violated truth." pp. 55, 56.

The Lamp of Power. This principle of architectural expression is the result of whatever quality in a building enables it to seize firm hold of the imagination, or rather of whatever quality is not included within the province of beauty. It may be the simple magnitude of the building, or the massiveness of separate stones, or its towering height, or its shape so ordered that the eye can easily take in the whole. The development of this idea, however, we are compelled to pass with this brief allusion.

The Lamp of Beauty, too, the fourth in the mystic seven, is so generally recognized as one of the most prominent aims

of all architecture, that we might dismiss it with a word; and indeed this is almost necessary, unless we would discuss the topic to its utmost extent, for the subject is intimately connected with the whole consideration of beauty in the arts. It is treated in this volume under the heads of Beauty of Ornament, Beauty of Design, and Beauty of Color. Some of the remarks on the *place* of beauty are worthy of much attention. Nature pleases us by appealing at the same time to many of our senses, and by presenting to them at once a great variety of delightful objects. The architect can select from these but a single subject, and represent it in a severe and inflexible material.

"Now let us consider for an instant what would be the effect of continually repeating an expression of a beautiful thought to any other of the senses at times when the mind could not address that sense to the understanding of it. Suppose that in time of serious occupation, of stern business, a companion should repeat in our ears continually some favorite passage of poetry, over and over again, all day long. We should not only soon be utterly sick and weary of the sound of it, but that sound would at the end of the day have so sunk into the habit of the ear, that the entire meaning of the passage would be dead to us, and it would ever thenceforward require some effort to fix and recover it. The music of it would not meanwhile have aided the business in hand, while its own delightfulness would thenceforward be in a measure destroyed. It is the same with every other form of definite thought. If you violently present its expression to the senses, at times when the mind is otherwise engaged, that expression will be ineffective at the time, and will have its sharpness and clearness destroyed for ever. Much more if you present it to the mind at times when it is painfully affected or disturbed, or if you associate the expression of pleasant thought with incongruous circumstances, you will affect that expression thenceforward with a painful color forever.

"Apply this to expressions of thought received by the eye. Remember that the eye is at your mercy more than the ear. 'The eye, it cannot choose but see.' Its nerve is not so easily numbed as that of the ear, and it is often busied in tracing and watching forms when the ear is at rest. Now, if you present lovely forms to it when it cannot call the mind to help it in its work, and among objects of vulgar use and unhappy position, you will neither please the eye nor elevate the vulgar object. But you will fill and weary the eye with the beautiful form, and you will infect that form itself with the vulgarity of the thing to which you

have violently attached it. It will never be of much use to you any more; you have killed or defiled it; its freshness and purity are gone. You will have to pass it through the fire of much thought before you will cleanse it, and warm it with much love before it will revive.

"Hence then a general law, of singular importance in the present day, a law of simple common sense, — not to decorate things belonging to purposes of active and occupied life. Wherever you can rest, there decorate; where rest is forbidden, so is beauty. You must not mix ornament with business, any more than you may mix play. Work first, and then rest. Work first, and then gaze, but do not use golden ploughshares, nor bind ledgers in enamel. Do not thrash with sculptured flails; nor put bas-reliefs on millstones. What! it will be asked; are we in the habit of doing so? Even so; always and everywhere. The most familiar position of Greek mouldings in these days is on shop fronts. There is not a tradesman's sign, nor shelf, nor counter in all the streets of all our cities, which has not upon it ornaments which were invented to adorn temples and beautify kings' palaces. There is not the smallest advantage in them where they are. Absolutely valueless — utterly without the power of giving pleasure, they only satiate the eye, and vulgarize their own forms. Many of these are in themselves thoroughly good copies of fine things, which things themselves we shall never, in consequence, enjoy any more." pp. 97, 98.

The Lamp of Life. The principle next in order is that which requires in architecture the evidence of a measure of creative energy, a vivid expression of the intellectual life which has been concerned in its production. There is a deep truth in this, applicable to far other things than architecture, a truth which we can better feel than describe. In the discussion of it in the volume before us, one fact is so blended with another, and the whole so dependent on illustrations, that we can hardly find a passage brief enough for quotation, which will indicate the author's course of thought. We will take, however, as coming nearest to our wishes, the closing remarks on the cutting of ornaments.

"I believe the right question to ask, respecting all ornament, is simply this: Was it done with enjoyment — was the carver happy while he was about it? It may be the hardest work possible, and the harder because so much pleasure was taken in it; but it must have been happy too, or it will not be living. How much of the stonemason's toil this condition would exclude, I

hardly venture to consider, but the condition is absolute. There is a Gothic church, lately built near Rouen, vile enough, indeed, in its general composition, but excessively rich in detail; many of the details are designed with taste, and all evidently by a man who has studied old work closely. But it is all as dead as leaves in December; there is not one tender touch, not one warm stroke, on the whole façade. The men who did it hated it, and were thankful when it was done. And so long as they do so, they are merely loading your walls with shapes of clay: the garlands of everlastings in Père la Chaise are more cheerful ornaments. You cannot get the feeling by paying for it — money will not buy life. I am not sure even that you can get it by watching or waiting for it. It is true that here and there a workman may be found who has it in him, but he does not rest contented in the inferior work — he struggles forward into an Academician; and from the mass of available handicraftsmen the power is gone — how recoverable I know not: this only I know, that all expense devoted to sculptural ornament, in the present condition of that power, comes literally under the head of sacrifice for the sacrifice's sake, or worse. I believe the only manner of rich ornament that is open to us is the geometrical color-mosaic, and that much might result from our strenuously taking up this mode of design. But, at all events, one thing we have in our power — the doing without machine ornament and cast-iron work. All the stamped metals, and artificial stones, and imitation woods and bronzes, over the invention of which we hear daily exultation — all the short, and cheap, and easy ways of doing that whose difficulty is its honor — are just so many new obstacles in our already encumbered road. They will not make one of us happier or wiser — they will extend neither the pride of judgment nor the privilege of enjoyment. They will only make us shallower in our understandings, colder in our hearts, and feebler in our wits. And most justly. For we are not sent into this world to do any thing into which we cannot put our hearts. We have certain work to do for our bread, and that is to be done strenuously; other work to do for our delight, and that is to be done heartily: neither is to be done by halves or shifts, but with a will; and what is not worth this effort is not to be done at all. Perhaps all that we have to do is meant for nothing more than an exercise of the heart and of the will, and is useless in itself; but, at all events, the little use it has may well be spared, if it is not worth putting our hands and our strength to. It does not become our immortality to take an ease inconsistent with its authority, nor to suffer any instruments with which it can dispense, to come between it and the things it rules: and he who would form the creations of his own mind by any other instrument than his own hand, would also, if he might, give

grinding organs to Heaven's angels, to make their music easier. There is dreaming enough, and earthiness enough, and sensuality enough in human existence, without our turning the few glowing moments of it into mechanism; and since our life must at the best be but a vapor that appears for a little time and then vanishes away, let it at least appear as a cloud in the height of heaven, not as the thick darkness that broods over the blast of the furnace and rolling of the wheel." pp. 144, 145.

The Lamp of Memory. Between the scenery of a newly discovered country and of a country old and long known, there is always this great difference, that the former, however grand, however vast, however beautiful, has associated with it no *human* interest. The mountains rise awful and solitary, the lakes expand like crystal mirrors, the virgin forests stretch from the rising to the setting sun; but they have witnessed none of the struggles of men, neither the birth nor the dissolution of empires; neither hero, nor sage, nor saint, nor martyr, has dignified or hallowed them by his footsteps. Nothing is so dear to us as close sympathy with our kind; desert places become populous, heaps of rubbish eloquent, when we know them to have been connected with great achievements, with human glory or suffering. The sympathy is more intense, the imagination more strongly impressed, the moral lessons more weighty, when there are visible and tangible memorials of the events. Thus there is ever a mutual and reciprocal influence between the historical truth and the visible monument. We look off from the pyramid with an interest increased a thousandfold, when we remember that perhaps from that very spot the eye of Plato was once, like ours, turned towards Memphis and old Thebes. Every pillar, every prostrate stone, of the Parthenon is eloquent of the glory, the refinement, the art of Greece. We have an idea of the life of the mediæval times, vivid beyond all former possibility, when we look upon the fortress-like palaces of Florence and Rome, — the dungeons where the Ugolinos perished with hunger, — the squares where the flames curled up around Savonarola the reformer, and Giordano Bruno the philosopher. Now this is one of the grandest results of architecture; nor can the architect rise to the full effect of his noble art unless he has this purpose of it fully in mind. A thousand years after he is dead, his work proclaims to every

passer-by, not *his* skill and toil alone, or chiefly, but the life of the generations which, like a mighty current, have swept by this firm landmark, and left upon it in imperishable outlines the memorials of their thoughts and feelings and deeds. "How cold is all history, how lifeless all imagery, compared to that which the living nation writes, and the uncorrupted marble bears! How many pages of doubtful record might we not often spare for a few stones left one upon another! The ambition of the old Babel builders was well directed for this world; there are but two strong conquerors of the forgetfulness of men, poetry and architecture; and the latter in some sort includes the former, and is mightier in its reality; it is well to have, not only what men have thought and felt, but what their hands have handled and their strength wrought, and their eyes beheld all the days of their life. The age of Homer is surrounded with darkness, his very personality with doubt. Not so that of Pericles; and the day is coming when we shall confess, that we have learned more of Greece out of the crumbled fragments of her sculpture than even from her sweet singers or soldier historians." It is this function of architecture, as a representative of *age*, that imparts to it its highest glory. "And this is a characteristic," says Mr. Ruskin, "to my mind so essential, that I think a building cannot be considered in its prime until four or five centuries have passed over it; and that the entire choice and arrangement of its details should have reference to their appearance after that period, so that none should be admitted which would suffer material injury either by the weather, staining, or the mechanical degradation which the lapse of such a period would necessitate."

"Therefore, when we build, let us think that we build forever. Let it not be for present delight, nor for present use alone; let it be such work as our descendants will thank us for, and let us think, as we lay stone on stone, that a time is to come when those stones will be held sacred because our hands have touched them, and men will say, as they look upon the labor and wrought substance of them, 'See! this our fathers did for us.' For indeed, the greatest glory of a building is not in its stones, or in its gold; but in its age, . . . in its lasting witness against men; in its quiet contrast with the transitional character of all things; in the strength which, through the lapse of seasons and times, and the decline and birth of dynasties, and the changing of the face of

the earth, and of the limits of the sea, maintains its sculptured shapeliness for a time insuperable, connects forgotten and following ages with each other, and half constitutes the identity, as it concentrates the sympathy, of nations. It is in that golden stain of time, that we are to look for the real light and color and preciousness of architecture; and it is not until a building has assumed this character, till it has been entrusted with the fame and hallowed by the deeds of men, till its walls have been witnesses of suffering, and its pillars rise out of the shadows of death, that its existence, more lasting as it is than that of the natural objects of the world around it, can be gifted with even so much as these possess of language and of life." p. 155.

Of this series, the *Lamp of Obedience* is the last. Architecture, like the other arts, is no irregular or fantastic production, but, like them, must be obedient to the necessities of the times, and the spirit of the people, their polity, life, history, and religious faith, out of which it must grow; it should not even be restless and anxious for the new, but eager for the beautiful, the grand, the fitting. So only can it be sure of a character, and rise to its grandest effects. There are, indeed, times when great changes are needed in art, and new schools are founded; but these are the result of a natural growth and development, and not of a mechanical compulsion. There are times when the life of art is shown by its throwing off ancient limitations; so there are in the life of an insect; and these are times of great interest to both.

"But as that would be both an uncomfortable and foolish caterpillar which, instead of being contented with a caterpillar's life and feeding on caterpillar's food, was always striving to turn itself into a chrysalis; and as that would be an unhappy chrysalis, which should lie awake at night and roll restlessly in its cocoon in efforts to turn itself prematurely into a moth, so, will that art be unhappy and unprosperous which, instead of supporting itself on the food, and contenting itself with the customs, which have been enough for the support and guidance of other arts before it and like it, is struggling and fretting under the natural limitations of its existence, and striving to become something other than it is." p. 169.

Not to weary our readers, we will add but a single paragraph, the closing one of the book, as indicating the serious, slightly sombre, and almost severe tinge of the writer's mind.

"I could pursue this subject willingly, but I have some strange notions about it, which it is perhaps wiser not loosely to set down. I content myself with finally reasserting, what has been throughout the burden of the preceding pages, that whatever rank, or whatever importance, may be attributed or attached to their immediate subject, there is at least some value in the analogies with which its pursuit has presented us, and some instruction in the frequent reference of its commonest necessities to the mighty laws, in the sense and scope of which all men are builders, whom every hour sees laying the stubble or the stone.

"I have paused, not once nor twice, as I wrote, and often have checked the course of what might otherwise have been importunate persuasion, as the thought has crossed me, how soon all architecture may be vain, except that which is not made with hands. There is something ominous in the light which has enabled us to look back with disdain upon the ages among whose lovely vestiges we have been wandering. I could smile when I hear the hopeful exultation of many, at the new reach of worldly science, and vigor of worldly effort; as if we were again at the beginning of days. There is thunder on the horizon as well as dawn. The sun was risen upon the earth when Lot entered into Zoar." p. 177.

We shall have answered our end, if we have gratified a few by the thoughts here suggested, and still more, if we direct any of our readers to a work abounding in close and exact illustration, which we have had no room so much as to refer to, as well as in passages of exquisite beauty and vivid eloquence, of which we have culled only a few of the most prominent.

ART. III. — *Dix Ans d'Études Historiques.* Par AUGUSTIN THIERRY, Membre de l'Institut. Quatrième Edition, revue et augmentée. Paris. 1842.

WHEN a child who has received a new toy, gives but one moment to the ecstasy of admiration, and straightway proceeds to pull the ingenious machine to pieces, the chances are that he will be made to smart for his diligence; yet the punishment, whatever may be said of its justice, is very sure to prove ineffectual. The angry parent ought to recognize in himself

the same natural impulse that he is striving to expel from the breast of his offspring. The disposition, the faculty, in us, that never meets an effect without searching for its cause, is common to all. Who will not bear witness to the satisfaction with which he learned how Pope filed down a score of rough verses into the needle-like point of an epigrammatic couplet; how Johnson used to forge a whole chain of ponderous and polished iambics at a single blast; and how the mind of Coleridge composed melodious rhymes whilst wandering amidst "the howling wilderness of sleep." Who that recalls the mood in which he first read Lockhart's Life of Scott, will hesitate to say, that not one of the wondrous fictions, the story of whose origin it unfolds, is read with a more absorbing attention? But our interest, which may well enough be pardoned for dwelling on the discovered mysteries of the Magician of the North, stoops much lower. After gazing with awe into the penetralia of genius, we are not unthankful for permission to explore the more common chambers of talent. Of all articles of *virtu* in the market, none find a readier sale than those autographic scraps which the writer would willingly have kept within his most private portfolio. It is deemed fortunate that the world has not lost the documentary evidence of the secret, once so carefully kept, that the wit which sparkles in buoyant globules all over The Rivals and The School for Scandal, instead of being the product of an instantaneous effervescence, was created by the patient elaboration of years. Curiosity descends even to the homely details of the epistolary art. We are delighted to find that Hume, the most indolent of mortals, seldom accepted an invitation to dinner without taking pains to transcribe, sometimes more than once, the note in which he signified his acceptance.

Certainly, then, it ought not to be thought matter unworthy of inquiry how histories are written; yet of all those who find curiosities in every other department of literature, how few consider that this, in some respects the most important and the most difficult of all, may equally well reward attention. If we reflect on the amount of labor required for the compilation even of the most unpretending history, and bear in mind that the maker of it has generally no fame to look forward to, and very little profit, we shall be convinced that hardly any

literary labor is so inadequately rewarded as this, and shall wonder how it is that the artist is supported in his work, and encouraged to persevere. The mere occurrence of events is never a sufficient reason why men should take to recording them. Even the genealogist can find little value in isolated facts. A collection of them may be used as canvas, on which the skill and taste of the painter may be displayed, or the lesson of the moralist and the philosopher may be illustrated. The former was the mode adopted by the ancients, who constructed histories as they wrote poems, expecting the same kind of fame as the reward of artistic excellence. In our modern times, political motives have had much influence in the production of books of this class. M. Augustin Thierry began to write with the belief that he, like most of those around him, was devoting his energies to politics. His early readers thought so too. We are told in this volume how both he and they came to be undeceived. In 1820, he began to publish, in the *Courrier Français*, a series of articles entitled *Lettres sur l'Histoire de France.* He wrote with enthusiastic ardor.

"Doubtless," he says, "I may have overestimated the practicability of bringing to view with the distinctness of scenic representation, the people as they existed at each epoch of our history; but this very illusion lent to my words the more warmth and interest."

The consequences were, that the populace cheered and the government persecuted.

"From the appearance of my second letter, I was treated by the journalists of the anti-liberal side as a public enemy. They accused me of aiming at the dismemberment of France, and of shaking the throne in robbing it of five centuries of its age. The censor mutilated many of my pages, and with his red ink quite cancelled the dissertation on the true epoch of the establishment of the monarchy."

A zealous political writer, we may readily believe, was not to be daunted by attacks like these, while encouraged by the approval of a hundred thousand readers; and M. Thierry tranquilly kept on his way. But, he tells us, an unexpected mortification succeeded.

"In proportion as I entered deeper into the discussion, the

political tinge faded off, disclosing the unattractive learning beneath. The interest of my articles was now limited to those alone who had a genuine fondness for scientific inquiry. Many letters, expressive of discontent, arrived one after another; and so bitterly did they speak of the *long articles, fit enough for the Journal des Savans*, that the persons who had direction of the *Courrier*, fearing a loss of subscribers, besought me to change my subject. I replied, that I had no desire to employ my pen on any but historical matters; and, in January, 1821, I ceased writing for the *Courrier Français*."

It was, then, not the enthusiasm which is inspired by political zeal that formed M. Thierry's chief support during his protracted and painful labors. We would not deny either the sincerity of his love of progress and hatred of absolutism, or the necessity of allowing such principles to have their influence on the historian as well as the citizen. No one can read our author's works without seeing in every chapter abundant evidence that he has faith in humanity, perhaps excessive faith. He is even more a republican than a Frenchman. He gives us clearly to understand, that wherever one race of men are oppressed by another, his heart and voice are on the side of the weaker. Still, liberalism is not the characteristic of M. Thierry's writings, — not that which entitles them to be treated as belonging to a class of their own. If his political sympathies have added much to the spirit of his works, they have not contributed the method.

That method he himself explains in the book before us. Some of our readers may here learn for the first time that the book itself is in existence, although it is now some fifteen years old. The History of the Norman Conquest, however, *is* known to American readers, and they cannot but be ready to hail with pleasure any thing that may throw light on its author's literary biography. *Dix Ans d'Études!* How much these words suggest! For years spent as M. Thierry spends them deserve to be called years of *study*. A writer on chronology, whose name is more familiarly known than his book, though that is by no means without merit, insists on the devotion of this very space of ten years as essential to the attainment of such a knowledge of history as every gentleman ought to possess. It would be amusing, and not uninstructive, to compare his course of study with that pursued by our

historian. The latter would prove on trial not the least laborious, yet the most attractive; and, if an inference may be drawn from M. Thierry's own shining example, the most fruitful of results.

From 1817 to 1827, M. Thierry's labors were divided between two objects, — the history of the English people, and the history of the French people. These terms are of moment. He was not engaged upon the history of the country, France; nor of the country, England; nor yet did he occupy himself with the acts of their rulers and great men, — their kings, generals, and statesmen. Thierry loves to take races as individual existences, and to view them psychologically. In these ten years, spent as they were in diligent and thoughtful investigation, his opinions, of course, underwent some change. At each step of his progress he was learning new facts, and at each step, too, his mind was increasing in vigor, and enabling him the better to grasp and estimate what he learned. But during the whole period, he was using his pen; and he has collected in this book such of these writings as are not embodied in his completed works. The book, accordingly, is made up of two sets of essays, more or less fragmentary. The pieces of each set, being arranged in chronological order, and presented to us (so we are given to understand) in the shape in which they came from the mind of the author, the whole collection may well "be of interest both to those who, having witnessed the final result of the author's labors, may be curious to know each point of the route which he has passed over, and to those who take pleasure in observing how the human mind proceeds in its individual developments." Yet it is not this part of the volume that we have read with most interest. We may undoubtedly see here how broad generalizations, struck out from the heated imagination of youth, have subsequently, in obedience to the dictates of experience and truth, been contracted to narrower limits and shorn of something of their glow. And we may even learn to accept with more confidence the final conclusions of a writer who has made so frank an exhibition of his early errors, and who has immediately, on recognizing that they were errors, so heroically abandoned them. After all, however, the Thierry of '27 is the Thierry of '17; and though an acute critical comparison of these fragments might

bring to view a more regular and clearly marked progression of mind than a cursory reading has made apparent to us, we can certainly point out assertions towards the close of the decennium quite as heterodox as any that precede them. What shall be said, for instance, to our author's declaration, in 1827, that "the word *Parliament* has done the history of England more harm than the thing itself has done the country good?"

The part which we value most is the Preface. In the compass of these fifty pages, we have an autobiographical sketch of remarkable vividness. The whole should be read, and in its own sinewy, untranslatable language. The scholar places himself before our view with his toils, his discouragements, his sufferings; and he communicates to us something of the untamable enthusiasm and resolute fixedness of purpose which, we are confident, even harder trials could not have subdued. Whether it be that there is a peculiar picturesqueness in this description, or that the circumstances themselves contain a suggestive power through their likeness to occurrences in the inner life of every man who has felt the hope (and who has not at some time been stirred by that dreamy and strangely exhilarating aspiration?) that he might have strength to leave behind him something "which the world should not willingly let die," we know not; but from some cause, the scene here presented is one which we cannot contemplate without an earnest sympathy. It teaches, at least, how unreasonable is that popular notion which would confine our interest to genius struggling after the grander walks of life. We have here no ambitious young soldier; no orator panting for an occasion; no politician, eager only for advancement; but one who, intent on none of these things, would win fame by picking history out of a parcel of monkish chronicles. We see him roaming restlessly through libraries, cramped by perpetually seeing around him evidences of what has been done, while tormented with doubt as to what he himself is to do. Suddenly a vision of order bursts on the chaos.

"One day, when reading attentively some chapters of Hume, I was struck with a thought which appeared to me a ray of light, and closing the book, I cried, 'All this dates from a Conquest;—there is a conquest at the bottom!' Instantly I conceived the

project of remaking the history of the English Revolutions by considering them from this new point of view."

Then had to come that trying reaction, when the mind, after an unnatural excitement, falls back upon itself, — a trying revulsion, because it is the test of the spirit's worth. It is not strange for any one to feel the intoxication of ambitious desire, nor do any man's faculties, when thus quickened, fail to shape out for him a plan which seems to insure success to him who shall be able to follow it. At the subsidence of this tumultuous agitation of mind, comes first a sensation of weakness, — a fear that too mighty a task has been attempted. This, however, can well enough be borne; time and rest, and that confidence in self, which is a part of the life of the soul, will cure it. Not here does the trial lie; but in the after conviction, which, although it begins with a fever and a quaking, is only confirmed by protracted thought, — in the sickening thought, that the plan itself, the darling scheme that appeared at once so brilliant and so sure, is a vain phantasm. The traveller did not falter when the mountainous way that stretched before him seemed lofty and difficult; but now the path itself is sunken, and leaves an abyss. At this point it is, that the weak spirit gives up in despair, and either preys morbidly on its own energies, or turns to the common business of the world, content to exist an undistinguished unit amidst a million others, and expecting to inscribe its name on no more enduring monument than a tombstone. Thierry approved himself a man of another stamp. Not discouraged because history was too stubborn to be bent into the shape which his imagination had conceived, he plunged the deeper into those mocking records, determined that they themselves should teach him the way to be original and great. He did not throw away his first plan, but kept it in reserve, subject to be modified, as far as need should require, and at some day, if his faithful researches should open an opportunity, to be put to use. The opportunity did eventually come; but meanwhile he gave a share of his attention to early *French* history also. He read with untiring diligence, turning away from no book or manuscript, however repulsive. Occasionally he met something which refreshed him like a fountain in a desert. Such an oasis was Ducange's Glossary, of which he speaks in enthusiastic terms, and

Sharon Turner's History of the Anglo Saxons. At last, in 1821, he entered definitively upon his great work. We quote his own account of this important era in his life.

"In a word, I resolved, if I may be pardoned the expression, to build my epopee, to write the History of the Conquest of England by the Normans, by mounting up to its first causes, in order subsequently to descend to its latest consequences; to paint this grand event in the truest colors, and under the greatest number of aspects; and, as the theatre for such diversified scenes, to take not England only, but all the countries far and near, which had felt the influence of Norman settlements, or the repercussion of the Norman victory. In this extended framework I meant to find room for all the important questions which had before successively occupied my mind; — the question, namely, of the origin of the modern aristocracies, that of the character of the primitive races, their moral differences, and their coëxistence on the same soil; and the question even of the historic method, considered with reference to that form and style which I had recently been attacking in my Letters on the History of France. What I had counselled I wished to put in practice; at my own peril, I wished to make trial of my theory. In short, I was ambitious to be the exemplar of an Art as well as of a Science; to be dramatic by means of materials which a sincere and scrupulous learning should supply. I set myself to work with a zeal proportionate to the difficulties of the enterprise."

What makes M. Thierry's example so valuable is, that with him, a fervid and imaginative temperament always impels to persevering labor. He informs us how he went from library to library; "from Sainte Geneviève to the Arsenal, from the Arsenal to the Institute;" in winter, disregarding the freezing atmosphere of some unwarmed ancient gallery, and in summer, patient under the mid-day sun. He describes this part of an author's life with equal poetry and graphic truth.

"The weeks and months, as they rolled rapidly by, saw me in the midst of these preparatory researches, where I was met by none of the thorny discouragements of composition; where the spirit, hovering over the materials which it is gathering, builds and rebuilds at its pleasure, and constructs with a breath the ideal model of the edifice which, sometime later, must be reared piece by piece, slowly and laboriously. . . . By dint of devouring long folio pages to extract a single phrase, and, in some cases, a single word, out of a thousand, my eyes acquired

a faculty which astonished me, and for which I cannot account; that of reading, as it were, by intuition, and of falling almost immediately on the passage that ought to have an interest for me. The vital force seemed to concentrate itself towards a single point. In the species of ecstasy which absorbed all my internal faculties, while my hand was turning over the leaves of the volume, or putting down notes, I had no consciousness of what passed around me. The table at which I was seated was crowded with books and relieved of them, the officials of the library and curious visitors came and went through the hall; I heard nothing, I saw nothing; — I saw only the apparitions called up in my soul by what I read. The recollection is still impressed on me; and since that era of early labor, it has never been my fortune to have so vivid a perception of the personages of my drama, of those men, so contrasted in race, manners, feature, and destiny, who successively presented themselves to my spirit, some chanting to the Celtic harp the never ending expectation of the return of Arthur, others guiding their barks through the tempest with as little care for themselves as the swan that sports on the lake; others, in the intoxication of victory, heaping up the spoil won from vanquished foes, measuring the land with a line in order to a regular partition, and counting over captive families by the head as so many cattle; others again, deprived by a single defeat of all that made life of any value, seeming either to submit with resigned patience to the sight of strangers seated as masters at their own firesides, or running in frantic desperation to the forest, to live there as wolves live, in rapine, slaughter, and freedom."

Then follows a beautiful picture of friendship, — of that refined communion of intellect as well as soul, the capability of enjoying which, more perhaps than any other attribute, is the distinction and the privilege of those whom the combined influences of nature and education have raised above the ordinary level of mankind. The next passage in his life is as full of interest and instruction as any thing that precedes.

"Thus passed the year 1821, whose most trifling incidents have a charm for me as I recall them, perhaps because this year answers, in the mysterious union which was then forming between the author and his work, to the first month, the sweetest month, of marriage. I entered, in 1822, on a period of toil harsher and less attractive; I began to *write*. Here it is, indeed, — in this realm where Fancy no longer bears rule, but, in its stead, calculating Thought, — in this intellectual process, by which we endeavor to make clear to the eyes of others objects

that we have seen very clearly ourselves, — it is here that weariness and chagrin meet the writer. The difficulty of finding an outward form for the ideal work generated in my mind was the greater because I rejected, with a deliberate purpose, the assistance which ordinarily the imitation of a model affords. I sought not to reproduce in my history either the manner of the philosophers of the last century, or that of the chroniclers of the Middle Ages, or even (whatever my admiration of them) that of the narrative writers of antiquity. I proposed to myself a sort of composite method, by which, if my strength should be adequate, I might unite to the epic movement of the Greek and Roman historians, at once the simplicity of coloring of the legendary style, and the severe reason of the moderns."

The History of the Conquest was finished and published in 1825. Some idea of the general conception to which the author has here given body and form, is furnished by the quotations we have been making. Perhaps no reader of the history stood in want of such explanation. Yet the mere title unquestionably suggests a quite inadequate notion of the nature of the work; and a person with no other understanding of it than this gives, might be excused for the surprise which he should manifest, on turning over the leaves, at observing in the margins dates denoting that this, which purports to be a history of the *Norman Conquest of England*, extends over a space of time measured in centuries. He would be tempted to exclaim, How is this? Does not every schoolboy know, that Duke William won the battle of Hastings, and changed his coronet into a crown, in the year of our Lord one thousand and sixty-six? True; but M. Thierry proceeds to tell us, what every schoolboy does not know, that when the bones of the great bastard had long been mouldering in the too narrow vault which his sons had purchased for the last resting-place of him who bore the title of Lord of England, Normandy, and Bretagne, the conquest begun by that crafty head and potent arm was still unfinished; that, for generations thereafter, the Celts, the Saxons, and the Northmen were not fused together, but coëxisted as separate and rival races; and that many subsequent political commotions, as to whose causes philosophers have been disputing with a waste of acuteness, are, in reality, to be referred to the continuing struggle of those ancient and forgotten, yet most mighty elements. The best description of the work is the summary one

which the author himself has given; — English history considered in the light of the conquest; and we have in this enough to account for its most striking peculiarities. Whatever may be thought of the plan in other respects, it has some obvious advantages. Before the author's strength has been wearied, or his imagination dulled, by toiling through details, he surveys the whole field, as Descartes surveyed the heavens, with the eye of genius. At once, a theory flashes on his mind. He seizes and retains it, and, after some necessary modifications, takes it with him through his subsequent labors. It is his guide, — a ready-drawn outline, that leaves him nothing further to do than to find materials for the filling up and the coloring. That part of his duty which ordinarily occasions the historian most embarrassment is the selection of incidents; unless, indeed, writing at first hand, he is contented to serve as a mechanical annalist, and to jot down notes for the benefit of a successor. The discriminating faculty needs tasking to its utmost. If we suppose all that is false and mistaken got rid of, how shall the *trivial* be discerned? That which he is anxiously seeking, not mere truth, but important truth, is whimsical and has a very Protean taste in costume. Now, it hides under rags; again, it is present, where one would still less expect it, amidst the pompous inanities of a court pageant. M. Thierry escapes all this perplexity. He carries with him from the start a test which informs him, with prompt and unerring fidelity, what must be taken and what passed by. Nothing is inserted doubtfully or at random; there is a reason for every sentence. The narrative is no patchwork of ill-fitting fragments. We who read are in danger neither of being jarred by conflicting statements, nor of having to plod through the morass of some tedious disquisition. Keeping before him an hypothesis, it is the author's care to take no fact which does not agree with and illustrate it. Hence the work is symmetrical, duly developed in every part, like a piece of statuary. In short, according to this method, the choice of materials is no longer left to the hesitating and unequal decision of judgment, but is given over to the determination of taste, — a faculty which acts instinctively and harmoniously.

But the inquiry meets us, — nor is it undeserving of consideration, — how far can this be called the true method of writing history?

It would be neither just nor expedient to require of the historian, that he should enter on each investigation with a perfectly unbiased mind. If history has a philosophy, it is a science. They, then, who devote themselves to it have a right to the privileges of other scientific laborers. Now, no discovery, or rather none of those grand generalizations that have shed a lustre on the path of science, was made by patiently examining every pebble which offered itself in that path. Bold conjecture, not less than careful experiment, is an essential part of that process which now, as heretofore, is most promising of great results. We are accustomed to talk of the historian's duty to set down facts accurately and faithfully; yet in truth, historians, in every case, at least, where they are not dealing with contemporary events, encounter no facts, but a host of statements in regard to which it is a question whether they be facts or not. At each step, a problem appears before even the most humble historian, and as he hurries onward in quest of the solution, he experiences all the exhilarating influence which accompanies the effort to solve any problem. No matter whether our writer be engaged on the annals of an empire or of a village; no matter whether the doubtful point relate to a sovereign's honor or to the longevity of a country squire; — there is a doubt, and he constructs a theory. The theory may have to give place, on subsequent development, to another, and that to a third; and perhaps, at the close of the investigation, as much uncertainty may exist as at first. Still, the inquirer has had enjoyment, keen and exquisite. In this pleasure we may recognize the secret source of that continuing and overflowing supply of this useful species of literary production on which we remarked at the outset. The fact is quite inexplicable on the common supposition, that writers of history are a race of dull, plodding creatures; than which, indeed, nothing is farther from the truth, for no class of men whatever includes more enthusiasts. But do we not find many a history lamentably unentertaining? Undoubtedly we do; and for the reason that the author so frequently does not know how to make us sharers of his own excitement. Instead of an account of the successive problems on which he has been engaged, he can give us but the string of dry answers which, in the nature of things, need not be much more amusing than the list of solutions at the end of a

child's game-book, severed from the charades and anagrams to which they belong. Sentence follows sentence, and we never suspect that the proposition in each is the result and reward of a most animated investigation. M. Thierry, instead of thus dividing his strength among an innumerable multitude of objects, seizes such of those objects as suit his purpose and fits them in places already provided in his scheme. Taking all the minute hypotheses which, in their single and unconnected state, are adequate to enliven the toil of the common historian, he makes them members of one grand hypothesis. His history differs from theirs in the same way that Caleb Williams differs from a bundle of magazine stories.

There is another and more important view to be taken of this subject. History — meaning by the term, all events collected — can afford us, on mere observation, no more distinct and comprehensive understanding than a savage has of the movement of the heavenly bodies, or of electrical and chemical phenomena. In complexity, indeed, and intricacy, and confused blending of fact with fact, a world of pure matter cannot be compared to one in which there are not only material agents at work, but appetites and passions, — spiritual forces indefinite, innumerable, and of endless diversity. So there is good reason why this universal life, this aggregate of millions of individual existences, should appear a chaos to any one who, raising himself out of the moving mass, pauses to contemplate its heavings. Yet, as in the grosser world there are uniformities which strike the rudest observer, so there are in the other or moral world, though far less marked, constant, and numerous. We are able to recognize, at least, that the confusion does not result from the absence of cause, but from the presence of a multitude of intermingling causes, which at times combine in the production of phenomena, at times meet in direct antagonism. But how are these countless agencies to be separated? And these compound effects, by what method may they be apportioned justly among their causes? The resolution of this double question will be the Philosophy of History.

The difficulty once clearly discerned, we are in a condition to appreciate the attempt which has been made towards its solution by the school of which, we suppose, M. Augustin Thierry may be considered a founder, as he is confessedly one

of its brightest ornaments. The process they adopt is something like this: In history, and even in the limited portion of the living universe that comes beneath our immediate observation, certain uniform sequences may be distinguished. One of these is expressed in the proverb, — like father, like son. This hereditary succession of physical and mental qualities is not invariable; yet the probability of resemblance, appreciable in any particular case, becomes much stronger and more manifest when we apply it to a *community*; and the fact that the doctrine receives additional confirmation the broader and more general we make it, is unquestionable proof that it is founded in nature — that it is, in the scientific sense, a law, or intimately connected with a law. Everybody perceives a national character, that descends from generation to generation, and undergoes little change at any one step. Now, say Thierry and his associates, this individualized aggregate, which has the attribute of possessing character, — this organic existence, Nation, (from *natus*, born, and implying descent from a common ancestry,) does not mean the collection of human beings that may chance to be spread over some given section of the earth's surface, — over this island, or that peninsula, or which we may find dwelling under a certain common government. No, they urge; the *races* of men are what the philosopher must look to.

For so much of the way the process is mainly inductive; but the other logical engine now comes into play. Towards the close of the eleventh century, there were in England, it cannot be questioned, at least three distinct races. From previous records we derive a tolerably clear conception of their several characters; and we know that the relations in which they stood, and the other circumstances of their situation, were such as would naturally make them tend to act in different ways. Here, then, we have certain forces; and if they are adequate to the production of the phenomena we afterwards meet, why not consider them the causes of those phenomena? To take an example: the controversy between Becket and Henry II., which shook England and all Christendom, is one of the most interesting, and perhaps most obscure, events in mediæval history. We see a man who was lifted from the dust by the mere pleasure of the powerful monarch whose wrath he now braves, stand his ground in the contest

like an equal, and this without having at any time the very hearty support of the Hierarch whose battle he is ostensibly fighting. The chronicles inform us, too, of concurrent insurrections throughout England; the very throne seemed to be rocking. That the danger was not unreal is put beyond doubt by the conduct of Henry himself, both in the submissions he made during Becket's life, and in the deeper abasement to which he descended after his death. Thierry discerns in all this the Saxons rising and making common cause with the stubborn priest, whose triumph they believed to have a connection with their own relief. The records of the times seem to give much countenance to the explanation, and our assent is quite independent of the fact, alleged by Thierry on perhaps insufficient grounds, that Becket was himself of Saxon origin.

But the same reign furnishes another remarkable opportunity for our author's application of his theory. Henry's continental subjects were no more homogeneous than his English ones; and far less tranquil were they under his rule. In Bretagne, and especially in the Provinces stretching towards the Mediterranean, the standard of revolt was continually rising. The insurgents had always in their camp one or another of the King's headstrong sons. These wars have usually been treated as mere family quarrels; yet so unnatural does it seem that children should wantonly take up arms against a father at once kind and sagacious, that chroniclers and minstrels have attributed their undutiful folly to the persuasions of a crafty and malignant tempter, Bertrand de Born, the famous Troubadour. Men, however, even bad and unscrupulous men, do not commonly act like devils from the mere love of mischief; and Bertrand must be supposed to have had some deeper motive. Though an accomplished courtier, he belonged to the subjugated Celtish stock. From such data, it is not strange that Thierry should infer that this person was actuated by a stern, reflecting patriotism, and that his efforts were accompanied and made important by the instinctive struggles of a people restless under a foreign yoke. Bertrand appears to him a man devoting all his wonderful powers, in the spirit of savage heroism, to one object, — and that the freedom of his country, to be effected by sowing dissension among its lords. The character of the Celts is

plausibly adduced as favoring the hypothesis, — a people brave enough in the field, but distinguished for a mental activity disposing them to prefer to attain an end by other means than animal force. To such a people, craft and dissimulation are not uncongenial. The scheme, too, of which Bertrand is supposed to have made himself the apostle, however visionary and impracticable, was one that might very well have attractions for a mind like his. To go from Frank to Norman, and from Norman to Frank, inspiring each by his artful eloquence with bitter hostility to the other; to infuse discord into the very households of the fierce and haughty oppressors; to arm sons against their father, brethren against each other; to be the master spirit directing this storm of passion and crime, calmly purposing that the elements of havoc, by exhausting themselves in mutual conflict, should leave the Gallic land a peaceful abode for the old Gallic race, — such a scheme, it is not difficult to believe, might readily suggest itself to a mind deficient in moral balance, but full of enthusiasm and conscious energy. It would seem that no fairer occasion could be found to exemplify the theory which reduces history to a conflict of races, and to prove its value.

Here, however, a minute examination does not confirm the speculations of our historian. The authorities he himself cites, and the sources of information thrown open by the diligence of the Benedictine historiographers, leave little room for doubting that the old view is the more correct; so far as the domestic broils which embittered the declining years of the first Plantagenet were not merely the enacting on a royal stage of those scenes of senseless and unnatural bickering which are too familiar in ordinary life to provoke either the notice or the reprobation they deserve, they are accounted for by the evident interest which the French king had in breaking the power of his overgrown vassal. The Troubadour was rather a tool than a governing spirit.

Yet if this part of M. Thierry's history fails to command our entire assent to its philosophy, it has other qualities which deserve unstinted praise. Let those who, in Lord Littleton, and even in Hume, have been unable to appreciate the romantic brilliancy of the reign of Henry II., read the narrative of our author, and enjoy the dramatic interest which he has thrown over it. The closing events of the old monarch's

life, the death-scene of his eldest son, Henry Fitz-Henry, as the chroniclers sometimes style him; the storming of the castle of Hautefort; the capture of Bertrand, and his appearance before the King, when, in sight of the axe and the block, and all the apparatus of death, the hardy Provençal, who had boasted that "he was master whenever he pleased of King Henry and his sons," is asked with a bitter taunt what plea he can offer for his life; the answer of eloquent simplicity and deep art, which turns that hour of hopeless extremity into one of triumph, — all these incidents, each so striking in itself, produce such an effect by their combination that, but for the references and citations in the margin, one can hardly be persuaded that they are historic realities. Nowhere, perhaps, could a better groundwork be found for a historical play. So rapidly do events crowd on each other that it would be possible, with little infringement of truth, to adhere to the strictest rule of the unities; while the characters, female and male, are so strongly marked and admirably contrasted, that they might be taken from history directly to the theatre. Yet he will be a rash man who shall attempt, though with the assistance of poetic diction and of all the machinery of the drama, to follow M. Thierry.

The consideration of these two instances, and especially of the second, shows very plainly why it is, that the theory of this school of French historians cannot be adopted *as a theory*, however it may be recommended by talent and laborious research. It is inadequate. There are other and independent forces, besides those it includes. The phenomena are far too complex to be so readily analyzed. And even if a nation's history were nothing more than the result of the action of the several races composing it, the investigation would still be attended with very great difficulties. The phenomenon, reduced to this simple form, is (as Michelet observes) of the chemical type; the elements mingled together produce, not a compound of distinguishable parts, but a new thing with attributes of its own. You cannot put a nation into a retort or a crucible. The objection may also be raised, that these very races, which we are told to keep our eyes upon, are not simple elements. This, it is true, might easily be answered, if it could be shown that the law of union alters at the point where races are combined to constitute peoples.

Mineralogy, it can be urged, is a science as well as chemistry. Without being able to analyze quartz, felspar, and mica, or knowing how much silicium, aluminum, &c., they contain, we may recognize that the three together constitute granite. So likewise, quartz, felspar, and hornblende in mechanical union make up syenite. These two rocks thus differ with respect to their third constituent. If, now, one whose knowledge goes no farther than this, should hear of a third rock, called syenitic granite, he would be guided at once to the inference that this is the descriptive name of quartz, felspar, and mica, the ingredients of granite, in combination with hornblende, the distinguishing ingredient of syenite; and he may have, besides, a tolerably accurate notion of the appearance and general character of this yet unseen formation. If we are sure that a certain nation is composed of the race A, and the race B, and the race C; that a second nation consists of A, B, and D; and finally, that a third consists of A, B, C, and D, — why should we not be able, from a knowledge of the two first nations, to draw correct inferences as to the character and history of the third? Because (if for no other reason) the analogy fails at the critical point; when races mingle, they mingle chemically.

This last truth does more than show an insuperable difficulty in the practical use of the theory; it goes a good way towards proving that, considered philosophically and in the abstract, the theory is vicious. In other words, it would seem that, if we are to make a science of history, we must resort to some other principle of analysis, and that this one, so far from being an assistance, leads us aside into fruitless labors.

But coming down from speculative dreams, which there is very little hope of our ever seeing realized, to the particular subject matter of M. Thierry's work, the general history of the English people, it is of consequence to know whether, without regard to the point of view from which he looks, he has seen the objects themselves correctly. What is the origin of that nation whose destiny it seems to be to fill the vacant places of the whole earth? How much does it owe of its energetic qualities to one of its two sources, and how much to the other? If we take the records, and trace its annual course from the eleventh century down, we shall find it difficult to see when it was, that the race which came over

with William lost the controlling influence which it plainly possessed immediately after the conquest. On the other hand, the Saxons cannot have disappeared. Impressed with both facts, one is tempted to think of the Anglo-Saxon people as a bulky carcase, into which the Norman elements entered as a quickening soul. Some would remove the wonder by telling us that, in our sense of the word, there was no conquest at all; and that William ascended the English throne simply as Edward's lawful successor, — a procedure much like that which takes place when, under the feudal system of inheritance, the lands of John Stiles fall at his death to his twentieth cousin, to the total exclusion of his brothers of the half-blood, which event, though not altogether accordant with our notions of fitness and right, we yet never think of calling a tyrannous usurpation. We cannot bring ourselves to any such belief. There may have been no complete conquest of the English people at Hastings; but that a conquest, properly so called, and overwhelming as a deluge, did at some time occur, we have irrefragable proof. Recognizing the conquest to the fullest extent, Thierry has not permitted himself to believe that the subjugated people can have yielded to their fate without many an impatient struggle. It is natural to expect that the hardy race of freebooters, whose standard of the war-horse had been a signal of terror to every shore on which it had been planted, would not sink at the first command into submissive slavery. Not one of us but must have looked for some displays of heroism by them; but we look in vain for one great and earnest effort made by them to redeem the name and the fortunes of their race.

Thierry feels and confesses a high admiration for Scott, who, for reach and penetrating acuteness of vision, is the standing shame of most historians. And an aggravation of the shame it might appear, that a romance writer should show a more ready appreciation of character, and should more vividly present before us real personages and events, than those whose business and profession it is to be faithful limners. Yet to this length of censure it is not right to go. No man is bound to equal Shakspeare, nor to equal Scott. It is possible, however, for the historian to take profitable lessons from both. This M. Thierry has done. But it is evident that he who follows a winged guide must needs have a strong and

discriminating head. Scott has little occasion even to *see* things as they are, much less to represent them to us as they are. When he encounters a chasm, romance lifts him over in impunity; while the historian, his follower, who cannot soar, must halt on the brink, or proceed at his peril. If Scott's picture is often as faithful a copy of the reality as any picture can be, it is because the true events and characters have more romantic interest than any that could be substituted for them. At the very time that he has seen, and enabled us to see, much that historians have been blind to, he has thrown a gorgeous veil over much that the historian ought both to perceive and exhibit. Truth and brilliant falsehood are mingled in the composition of all his romances, and in what the merit of them lies we shall find out when we begin to examine, whether those that are confessedly the greatest possess also the largest share of the former element. Take The Talisman; — what more fascinating and delightful narrative! But has it the qualities of history? In its scenes and incidents, it must be admitted to have little more claim to credibility than the adventures of the Caliph Haroun Alraschid, as detailed by that renowned, but not over-veracious story-teller Scheherazade. And as to the *characters*, would the Crusaders recognize the portrait of their leader, and the Saracens that of their terrible foe? Is this Richard, the Lion-heart — the chivalrous knight — the self-denying captain — the generous friend — the clement lord — the same that the chronicles (Thierry himself their interpreter) tell us of; the ferocious, the brutal, the most savage exemplar of a savage age, — a being whose hard and cruel nature is scarcely caricatured in the ballads which tell us that when the monster was hungry, the choice morsel for which he first shouted was a fat Saracen babe? The Betrothed was published along with the Talisman, whose shelter it much needed, said Constable; and readers and critics, even the author himself, have agreed with the shrewd publisher in the opinion of its inferiority. Yet according to our judgment, — and we know not that many, on consideration, will differ from us, — out of the whole list of the Waverly romances, none can be pointed out as a more truthful representation of the times of which it treats.

There is one of Scott's works which must have a particular attraction for the historian of the conquest; and we were not

surprised to find a spirited analysis of Ivanhoe constituting a portion of this volume. We have no need to go further for a very good illustration of the difference between romance and history. With M. Thierry, we can discern that Ivanhoe contains among its dramatis personæ one who may very well stand as a type of the Anglo-Saxon race; but his view and ours do not fall on the same individual. If we are right, this representative of the body and substantial groundwork of the English character is not the choleric, high-spirited Thane of Rotherwood, feeding on the memory of the days of Hengist and Horsa, — not Wilfred, winning the respect of the Normans by adapting himself to their customs, and excelling them at their own warlike arts — not Robin Hood, the gentle highwayman, who plundered the rich to feed the poor — nor yet Athelstane the Unready, (though he comes nearer,) who deemed an unstinted supply of venison-pasties, not too strongly flavored with garlic, almost a full satisfaction for captivity. None of these, but the swineherd Gurth is the true type of his race; and next to Gurth, we should turn to Fangs. Indeed, man and dog ought to be taken as parts of one whole. Here is the nature of a noted race well exemplified, — a nature with propensity enough to vice, and some of whose virtues even have quite a vicious aspect; yet a nature which is the foundation of all that is most valuable in the English character and in ours. We see the Saxon all before us, with a temper tough as his weather-beaten hide, bowing his shoulder obediently to the heaviest burden, never answering a blow till the smart is gone, yet clinging to property with unflinching tenacity, enduring hardship with a patience that is sullen, and in the most prosperous times giving little other expression of complacency than a surly growl. Not a particle does he possess of that spirit which has kept the races of the Celtic stock distinct and unsubdued for so many ages in the fastnesses of Wales, in the Irish bogs, and in the misty valleys of the Scottish highlands. The Celt, with many of the qualities of poetry and romance, resists all influences, and retains to the last some portion of his individuality, his independence, and, in the same degree, his original barbarism; the Saxon, quite destitute of the heroic virtues, has few claims on romance, yet so it is that he has won of history a notice such as all the Celts on earth cannot obtain.

It is a truth which we are too often disposed to forget, that the *passive* virtues are those which have most to do with national well-being. The value of these virtues being recognized, it is of little moment whether we attribute them to original organization, or to circumstances, or — which is probably most correct — to both influences. The epitome of English history, as we should state it, is very brief and simple. Our race now bears liberty well because it has been trained in endurance, and has profited by it. The people, the Anglo-Saxons, never could forget, while they were engaged in any contest with their sovereign, that there was another power in the state which they could not choose but regard with awe, — the baronial. As they crouched beneath the heavy hand of their immediate lord, the Norman noble, they learned to bear the additional measure of freedom allowed them from time to time by their king, without being betrayed into an insolence which is its own destruction. They took what was given them, never rejecting any thing because they could not get more. Yet whatever they received, they kept fast hold of; their stubborn tenacity surpassed, if possible, their patience. All this, perhaps, would not have brought that about which we see, had not Providence mercifully provided against their getting free from both their masters at once. When the feudal baron fell, unsmitten by any hand but his own, the sceptre was in no feeble grasp. History can scarcely show us another race of princes like the Tudors. During the reigns of the two Henrys and of Elizabeth, England made a vast advance in constitutional liberty; and that advance, though apparent enough to us, was so gradual, that at the time it was making, most keen-sighted statesmen did not observe it. The people strode on at a steady pace, never breaking into a run, nor even a leap.

Yet it by no means follows, that M. Thierry is to be blamed for constructing his history on an hypothesis, because we are not satisfied that his hypothesis is capable of philosophical verification. A vigorous thinker of our day, whose work is a guide to investigation in every science, well vindicates hypotheses in physics from the undiscriminating censure of those who are anxious to be accounted Baconians of the strictest sect. Such hypotheses are systems of classification, which connect together the separate facts we obtain, and in this way

are a very important assistance to the discovery of the law, or true natural method. Indeed, the hypothesis is not always useless, even after we know the law. For example, we are now very well assured that the earth is not the centre of the universe; yet astronomy does not disdain, for some of its purposes, to make use of the supposition. A similar justification may be extended to hypotheses in history. They serve as principles of association, to join together events upon whose real, philosophical relations we may vainly speculate forever, and which otherwise must be disconnected and comparatively useless. They render no mean service merely as helps to memory. In continued analogy to the case of a physical science, hypotheses are more useful in the history of obscure periods than of those which are recent and better known. They assist the mind across those dark mediæval wastes, and relieve it from the exhaustion on the one hand, which must be the consequence of attempting to obtain a more definite and exact notion, and from that state of blank inapprehension on the other, in which it passes with closed eyes over every thing, because it is able thoroughly to understand nothing. They are not unlike panoramas, which we do not expect to find as accurate as a minute geographical description, but which convey to us, better than the geography, a conception of the general aspect of nature, and especially of her grander features.

It is possible some admirers of Thierry may regard this as equivocal laudation. We do not so mean it; yet there is other and higher praise to which he is fairly entitled, — for, after all, whatever importance a historian may attach to his philosophical theories, that quality to which he will owe his most permanent fame is the effectiveness of his narrative. This may seem a humble phrase, yet it comprehends that graceful style, that vivid portraiture of men, that dramatic representation throwing audible voices into the printed page, that orderly arrangement, itself the gift either of genius or of the very highest art, that whole array of qualities, each of which gives the historian high distinction, and which, when united, insure him immortality.

We do not wish these remarks to be taken as an attempt towards a critical estimate of the History of the Conquest. We began this article merely with the view of giving some

extracts from an interesting volume little known on this side of the Atlantic, and of connecting them together by a few passing comments. Such, however, is the suggestive nature of the book that it is difficult to resist the temptation which it presents to a wider range of discourse. We do resist as well as we may, and, without pretending to assign M. Thierry's history its proper station as compared with other historical works, or even to decide between the rival claims of its own several excellencies, we would simply say that the author has been more successful in one of the two purposes with which he started than in the other. It was his aim, as we have seen, to make his work a tribute both to a science and to an art. Perhaps there was an incompatibility in the two services; at all events, it seems that the votary, though sincerely persuaded that he was all the time paying his chief homage to the severer and more spiritual goddess, yielded up his heart from the first to the fascinations of the beautiful occupant of the other, and, as he chooses to esteem it, lower shrine. That M. Thierry has given us a model in the historic art we see and know; that he has laid an unexceptionable foundation for the science of history we are constrained to doubt. We would not deny that there are facts which go far to countenance the view of those who refuse to look at history except in connection with ethnology. The case of the Jews, indeed, which is most referred to, is so unique that, instead of building a system on it, we should rather incline to the old-fashioned faith which regarded it as a standing miracle in fulfilment of prophecy. It is quite unnecessary to have recourse to this peculiar instance to establish the truth, that a race may preserve its characteristics for a considerable length of time. The Irish stand forth in proof; and it was the contemplation of this people, (who have a natural connection with a work on the conquests which have taken place in Britain,) that probably led M. Thierry to rely upon his hypothesis more than he would otherwise have done. We have no disposition to undervalue ethnological truths; not only are they intrinsically of importance, but the historian is especially bound to regard them. Yet we do object to making history merely the illustration of ethnology. Ethnological facts, undoubtedly, have sometimes a strong bearing upon history; and of these the historian must take note, as he does of any other important

facts. He will find it difficult to discern them, for, when they are thus influential, they stand out strongly marked and unmistakable; whenever they are not plainly visible, the historian may safely conclude that it is not worth his while to spend much time in searching for them. The task of such recondite investigation had better be left in the hands of the physiologists, to whom it belongs of right, and whose zeal, though recently kindled, and perhaps productive as yet of no very solid results, has brought to light facts sufficiently curious and remarkable to give them a fair claim to all the honor that may attend future discoveries.

In running over the outline which M. Thierry gives us of his ten years' labors, the necessity of selection has compelled us to pass over those portions that have not especial reference to English history, notwithstanding their intrinsic value. We cannot now leave the book, however, without recapitulating, aside from any purpose of criticism, a few additional facts in the author's life as here detailed. His history, immediately on its appearance, procured him a reputation surpassing his hope. But this joy, he plaintively adds, great though it was, had a full and a sad counterpoise. He had bought fame at the price of sight. His own description of the on-coming of his malady, and of the resistance made to it by scholarly enthusiasm, is so poetic that we cannot pass it by. The great task ended, and having become, as he tells us, incapable of reading, he thought at last of repose. Notwithstanding the employment of the most powerful remedies, his sight continued to decline, and as the last prescription of medicine, he was directed to travel. He went to Provence, where his old friend, M. Fauriel, whose researches had reference to the completion of a work on the early history of southern France, joined him.

"Compelled to idleness," he continues, "I followed my laborious companion from city to city, and watched him, not without envy, as he plunged into libraries and collections of old public records to examine every relic of the past. It was thus we occupied many months in traversing Provence and Languedoc. Myself not in a condition to read, — I do not say a manuscript, but the most beautiful inscription on stone, — I still endeavored to derive some benefit from these journeys by studying, on the monuments themselves, the history of the architecture of the middle

ages. I had just sufficient sight to guide my steps; but when I stood in presence of the edifices or ruins from whose inspection an epoch was to be recognized and a style determined, I know not what internal sense came to the aid of my eyes. Quickened and inspired by what I am willing to call the historic *passion*, I saw farther and more clearly. Not one of the principal lines, not a single characteristic trait, escaped me; and the readiness of my *coup d'œil*, so uncertain in ordinary circumstances, was a cause of surprise to my attendants. Such are the last perceptions that the sense of sight has given me. One year after, this remnant of joy, so limited and yet of which I had so exquisite an appreciation, was no more allowed me. Sight was all gone."

But his indomitable zeal was not daunted by the necessity of having recourse to the eyes and hands of others, and he engaged in fresh labors; — like a distinguished historian of our own country, whose resolute contest with a similar affliction has caused us to follow his subsequent course with a more earnest sympathy, and to feel a prouder joy in the triumphs which have crowned it. He undertook, in association with Mignet, a sort of compilation in mosaic-work of original chronicles relating to the history of France, from the fifth to the seventeenth century, on a plan of imposing comprehensiveness, but which, they both at length became convinced, it was necessary to abandon. Then he published, in a connected form and with thorough revision, his *Lettres sur l'Histoire de France*. Afterwards, he thought to join his brother, M. Amédée Thierry, in a great national work which should fully unfold and exhibit the origin of the French people. It seems characteristic of M. Thierry to bestow ready praise, untinctured with the least jealousy, upon all his fellow laborers; but of this brother he delights to speak in terms of the most loyal affection and pride. He warmly tells us what real pleasure the contemplation of this fraternal league afforded him, and how exhilarating and pure was the hope that, by means of it, "the names of both might be carved into the double base on which the edifice of their nation's history should permanently rest." Amédée Thierry accomplished his part in giving to the world the History of the Gauls; the other brother, whom we have been following, and who among us has almost exclusively appropriated the family surname, was met by an obstacle worse than blindness, and too strong

even for his courageous energy. He had encountered that other calamity, so appalling to most men, without dismay; he had "made friendship with darkness." But now, acute pain, attended by prostration of strength, declared the presence of a nervous malady of a serious nature. He was constrained to acknowledge himself vanquished, and this statement closes the account of these ten important years. "Since then," he adds, "I have found no more like them, and have only been able to glean here and there a few hours of labor among long days of suffering."

It is fitting that we should leave M. Thierry to tell us in his own words what lesson is to be drawn from his life. That he should use the tone of a man proudly conscious that he has a right to hold forth his example for imitation, cannot be thought unpardonable in one who has toiled so faithfully, and accomplished so much by his toil. While it is possible that the ardor of his temperament, stimulated by the applause of sympathetic friends, the truly national and Gallic cast of his mind, and, more than all, an earnest, continued, and unreserved devotion to a single aim, may have led him in some measure unduly to magnify his office, and to assign to it a relative importance which we, surveying objects with senses not obscured by so great an elevation, are able to perceive is excessive — still, far from us be any inclination to captious disparagement; rather let us frankly and cordially declare what an honor it is to any nation that it contains M. Thierry. We may profitably take his exhortation home to ourselves, well knowing that the example set by him and those like him must kindle emulation somewhere, and reckoning it a shame that, while the nations of the Old World are producing such men in what we call their decrepitude, America, in the very prime of its strength, should appear to be giving birth to a puny and degenerate offspring.

"If, as I take pleasure in believing, the interest of science is to be counted in the number of great national interests, I have given to my country all that the soldier gives it who leaves a limb on the field of battle. Whatever be the destiny of my works, this example, I trust, will not be lost. I would have it serve to combat that species of moral enfeeblement which is the disease of the new generation; — I would have it lead back into the right path of life some one of those enervated souls who, bewailing their

want of faith, and uncertain on what to lay hold, come seeking everywhere and find nowhere, an object of regard and service. What right have they to say, that, in a world like this, there is not air for all lungs, employment for all intellects? Is there not here calm and serious study? And does not this offer a refuge, a hope, a career to be run, to every one of us? With it, a man may endure bad days without feeling their burden; he is the maker of his own destiny, he uses life nobly. This I have done — this I still would do. Had I to recommence my way, I should choose that path which has led me where I am. Blind, and suffering without hope, almost without respite, I can render this testimony, which, coming from me, will not be suspected: — there is in the world something which is worth more than the pleasures of sense, more than fortune, more than health itself, — and this is, devotion to Science."

Art. IV. — *Christian Consolations. Sermons designed to furnish Comfort and Strength to the Afflicted.* By A. P. Peabody, Pastor of the South Church, Portsmouth, N. H. Second Edition. Boston: Crosby & Nichols, 1851. 12mo. pp. 367.

We have read this volume with admiration of its fitness to its design, of the vigor of its style, and the resources of experience and learning it implies. But our regard has been still more strongly drawn to the decided stand taken in it throughout, as to the character of true religion and the importance of the Christian faith; and though we have no space for the large discussion of topics so momentous, we have thought that our readers might entertain a brief treatment of questions alike the most fundamental and the most vexed of our own as well as other days. Our last number, in one of its articles, treated of the relations of science and religion. Welcoming the suggestions therein made, as to the peace and positive harmony that should exist between these two, not as rivals, but as friends, we would continue the subject to such points of observation as the book under notice suggests.

Is religion the child of nature, or a descendant from the skies? born of the earth, or the immediate daughter of God?

discovered by the human mind, or revealed by divine inspiration? Through whatever variety of terms the statement may be made, this is the great inquiry. Our author is most earnest and constant in his position, that all true religion, and Christianity in particular, as the highest form of religion, though regarded by some in these times as a mere result of the progress of knowledge and the development of our own understanding, is supernaturally derived. On this ground, we are in perfect sympathy and full communion with him. We must express astonishment at the character of the speculations to which some have been led by holding to the opposite opinion. To these persons, nothing but the mud beneath and man upon it seem to be left; there is to them no personal God, no heavenly communication, no assured immortality. But it is instructive to notice that the same curious scene, which in past ages has often appeared on the stage of unbelief, is now acted over again, in the skepticism that actually prevails. Those who deny any thing miraculous or superhuman in Jesus Christ, are often by no means slow to greet the pretence of miracle when it comes with dubious signs and from weak vessels. It would seem as if the mind of man, from its very constitution, was made for something beyond nature, and must have food that grows on no earthly soil; and therefore, when it has rejected the mighty works of God and the "loaves" from the hand of Christ, it must try to nourish itself on the husks of superstition. The belief in something which is above or beyond nature, though expelled from its rightful dominion and denied in its legitimate proofs, is still loth to go; it has a secret handle in the soul to which it holds, and will, with a sort of holy revenge, haunt its formal and showily wise rejecter with apparitions and enormous fancies, deceptive shadows of the lost substance. In the judgment of many, this is the period for finally exploding all belief in miracles, and for reducing all the facts of history to simple and intelligible laws, casting out as false whatever falls not under the measure of these laws. But is it not the period also, to mention no other class of prodigies, of the Rochester knockings, now announced as speedily to become universal? And are not they, who are most deaf to the claims of the Great Teacher, most willing to lend their ear to this vulgar appeal? They will not believe that the son of

God healed the sick and raised the dead, but they will admit that spirits from the eternal world have been rapping on their tables! Truly, as one said, they who believe not what they ought, are prepared to believe all they ought not. The glorious doctrines and momentous precepts of the world's Redeemer cannot sanctify to their acceptance his marvellous deeds; while the shallow and trivial messages of these newcomers from the spirit-land raise no doubt that the celestial gates have been indeed opened. They are not even staggered by the fact that, if the personages supposed are veritably with them, some of them, at least, do not seem to have profited by their sojourn among the exalted privileges of that mysterious, transcendent state. We can personally testify that Dr. Channing, who appears to be a favorite spirit with these summoners of witnesses from beyond the grave, does not, to our thinking, converse and reason as well as he did on earth. It is certainly a marvel, even in this century of wonders, that events in the Christian history, buttressed with pillars of testimony of unparalleled strength, must be set aside or explained away into myth and hallucination, while credulity opens her hungry mouth for every sign of fresh portents, as though Thomas Browne's opinion still prevailed, that there are not miracles enough.

But with this craving for the wonderful on the one hand, there is certainly a tendency on the other towards exclusive trust in mere physical science, represented perhaps most conspicuously in the doctrines of the French philosopher, Auguste Comte. Positive knowledge, which proceeds only by the development of constant and well-ascertained laws, is the idol of his mind and of other minds like his, ignoring as wholly beyond human reach the Ordainer of these laws, and the purpose for which they were ordained. Even in such minds, there must sometimes be a reaction, and an assertion by the supernatural element of its rights. Meantime, as an argument from reason itself for the religion of Jesus, we must affirm that they violate *human* nature, at least, who attempt to limit it to the information derived from the senses and to the conclusions of the inductive faculty. A whole class of the soul's powers and manifestations are thus put under the ban; and as these are real powers and great manifestations, we see not why it is any more in the spirit of true philosophy to

deny and exclude them, than it would be to shut out, or overlook as insignificant, in the sum of the universe, a fish or a fixed star. We rejoice that some of our most distinguished men of science are not disposed to banish them from their domain, but to do them hospitable justice. We would maintain not only their legitimacy, but their independence and superiority. The truths of religion are not, or they are but very partially, the deductions of natural science. Some truths, essential to the soul's peace and salvation, lie wholly beyond the scope of unaided human wisdom, and, as all history proves, cannot, even by the masters of earthly knowledge, be drawn out of any hiding-places in the material world.

Nature, to use a Baconian phrase, must be noted as defective. She can tell us of the divine strength, and skill, and goodness. But we want to know, not only whether there is understanding with the Most High, but also whether he loves us as his children, cares for us with a particular providence, will forgive us our sins, and rescue us from the swift decays of mortality for an endless being. There are many such questions, which nature cannot answer, nor can our own minds respond with a confidence at all equal to the eagerness with which they are asked. God's inspiration through his Son gives the reply, and has thus for itself the twofold support of its own demonstration and of the natural want which it meets.

This light from heaven transfigures, indeed, the outward nature that could not be its source, making it no longer, as to the man of mere science, a skeleton of lines and laws, like Boscovich's arrangement of all creation as a series of mathematical points, but alive and breathing with the Maker's being and benignity. The ancients guessed and groped to find, within the material globe, the globe of spiritual truth, and *felt* after God, if haply they might find him; and modern writers have sometimes ridiculed the old sages and schoolmen for placing the benefit of science, not in any point of human comfort, but in contemplation. The antique scholar's scorn of the homely applications of wisdom was doubtless an error or exaggeration; but it was a more generous error, a nobler exaggeration, than to regard the whole, which they called order or beauty, as made to minister to sordid gain and sensual pleasure. The office of the wind as the messenger

of heaven is grander than the service it renders by merely filling the sails of our ships; and an eclipse, superstitiously interpreted as the frown of God upon wickedness, has a nobler language for the soul than when only made the basis of a calculation. And though the trophies of this age are not to be despised, but admitted; though we can pencil a diagram to measure the earth, and throw it into our scales to be weighed; though we can groove its rocks and hills for our roads; bend its vapor into our motive power; make of its lightning our pen; and, like a conjuror, draw a circle round its storms, and unseal for our curiosity the sepulchres of its ancient forms of animated being, where they have been interred through unimaginable cycles of duration; we need still more than all this, to know from God, through some direct messenger, that the earth itself is but the primary school of boundless instruction, and a stepping-stone for his faithful ones to a higher sphere.

Science herself is, we know, a religious teacher of important truth, and perhaps she may be an illustrator of all truth; but, beyond this world, the spiritual world alone can be the fountain of that knowledge of God which the soul needs for its sustenance and hope; while it is preposterous, or a sheer absurdity, to suppose the Almighty limited in his communications to the one channel of his outward works, and unable to choose secret or supernatural ways to his children's minds. Why not admit organs and faculties to receive him in these ways, to be as legitimate parts of our nature as are our senses and logical understanding? Have we not a capacity for moral and spiritual ideas, as well as for generalization from particulars? and does not every one, who ever had an *idea*, know that it is a very different thing from a generalization, however broad and exhausting, — that it is even the visitation of a spiritual power? And if such a being as Jesus Christ comes to live in the world, affirming that he is at the same time in the bosom of the Father, that he takes the things of God to give to men; even aside from this peculiar proof of his mission, shall any one presume to scorn the very proposition as incredible, because not lying on the plane of scientific observation? If Paul, with his lordly intellect, says he "knows" he is immortal, shall his declaration be denounced as a weakness and delusion, on the assumption that no human

perception can reach to such a fact? A man with a telescope may see a world which cannot be discovered by another man with the naked eye. The worldly, irreligious, purely scientific mind is the naked eye.

The faculties for science and those for religion are diverse, and the processes by which they operate are distinct. What mensuration or arithmetic, what acuteness of sense, precision of analysis, or embracing under one form multitudinous particulars, can compass or realize the things that are spiritual? For these, there must be other conditions in the sensibilities, meditations, and prayers of the soul. Science and religion can be in concord only when, occupying aright their respective provinces, they have a hold in proportion to their relative importance on the human soul. But physical science must be the servant, and, in some sense, the expounder, of religion, placing truths too vast for comprehension, or too dazzling for steady sight, in her secondary illumination, while she does her own work of richly furnishing with facts and rules the human mind.

We had intended to make some remarks on the Bible as the organ of spiritual truth. This book of books has been greatly wronged in being regarded as designed to convey literal or scientific, instead of religious truth. The account, for example, in Genesis, of the creation, is now a field of battle between the students of Scripture and the students of the world. This strife ought to cease, from the consideration, that no theoretic cosmogony is, in that book, *intended* to be built up in the understanding, but only a picture drawn to fill the dormant imagination and move the religious sensibilities of the soul. It is not to be supposed, that the author himself of that wonderful painting presumed that he was giving a literal narration how, or in what precise intervals of time, God made the world. Nevertheless, his sketch stands with unaltered lines and in unfading colors, and, fearless of a rival, holds, through all generations, its bright ideas of the creative work before the human soul. The reason is plain. A literal, is not the only legitimate, or the highest, account of such a thing as the creation of God. Nay, — there is, has been, or can be no such thing as a literal account. As we feel we do not violate the truth of the world when we speak of it phenomenally, or as its opera-

tions appear, but not as they mathematically are, and say the sun rises and sets, instead of saying the earth turns on its axis; so, may there not be a poetic as well as a physical way of describing the material universe, genius no less than fact having her story to tell, and inspiration, as well as observation, a discourse to deliver? How lawful this claim may be is manifest when we inquire whether, with all these marvellous advantages of the progress of science, the geologist has given us any better delineation of the creative energy and the original manner of its proceeding, than we find in that old, but never antiquated map, which holds fast its tracery on the page where it was printed more than three thousand years ago. Can any modern pencil portray the same subject for the same end, of quickening the religious sentiment, more successfully? As the eye of our fancy rests on this ancient masterpiece, the scene is alive, and the figures move; the elements sublimely stir themselves at the Maker's word; light and heat, air and moisture, run like servants on his errands, and range themselves in the proportions of his design; while in and over all, God is ever supreme with his spirit and law, his wisdom and love. In the Scripture point of view, of religious knowledge, what can any discoveries in natural science, any mineralogy or chemistry, any comparison of strata, dislodgment of fossil remains, or enumeration of æons, do more than repeat and confirm, without contradicting, the effect of such a narrative on the common heart?

The Old Testament has sometimes been characterized as one of those petrifactions of formerly living creatures which modern science unearths. But not thus. As a classic author finely says of the world, that it does not grow old, so this Testament, ancient like the world, is like it too in being ever fresh. The loose ranking with it of Koran and Veda, by some skeptical thinkers, is vain against the true scholar's testimony and the facts in the case. The wonderful book of God still lives, and keeps alive customs and languages that would otherwise have long since been dead. Its light, like the sunshine, flows from the fountain of light, and its gracious dew falls every day, as out of the windows of heaven. The whole Bible has an organic hold of us. While we criticize it, it lies far back at the root of our being, and is the "meat" upon which we have "grown so great." It is not maintained

by us, but has borne us; and any hostility to it is a quarrel with the benefactor of our infancy and childhood, and a suicidal war against the vitality of our existence. Upon its "sincere milk" our ancestry and the heart of the world have been nourished; nor can we tell from how great moral evil we have been saved, or how largely to whatever good is in us we have been nurtured by this vast, deep, original power. It is the spring of an endless current of poetry, eloquence, converse, commentary, and quotation. A book, — it is the mother of books, the begetter of huge folios, the nurse of literature, destined to survive all its outward progeny, and be coeval with the memory of the soul.

But we must tear ourselves from so great and inviting a theme. The relations of religion to science open a vista of thought into which we have been able only to glance. To the divine mind, the two may be identical. To the human mind, they can be generally discriminated, but not by any distinctions that cut through so as to part them entirely; for, though distinguishable, they are wedded, and should never be divorced. Speaking not categorically, but we think with substantial correctness, we should describe their diversity thus: — they differ in their sources. Science comes from the world of appearances and arrangements; religion from the world of spirits, shining through these, or with direct light, upon the soul. Science alone cannot build up her tower unto the heavens, and, attempting to do so, ends only in a confusion of tongues. All our knowledge is Babel without the inspiration of God. The truth of his being, character, and will escapes the survey of the senses, and foils every effort of the scientific intellect. The author of that truly interesting little work, entitled the "Stars and the Earth," fails, we think, in the endeavor to give us an understanding of the Divine omniscience. No calculations of space and time, no material pictures, can compass it. It can only be hinted at by the outward world. It is no mechanical estimate, or argumentative inference, but an *idea*, which the finger of God must write on the tables of the heart. For religion and science, differing in their sources, differ also in the faculties which they exercise, and in the processes by which they are apprehended, as they do in their aims and results; science unfolding the resources of this world, religion disclosing the

realities of another; science improving the outward lot of man, religion his inward character; while both agree, in their true estate, to give light and bear fruit for the joy and blessing of man.

If we may dwell for a moment on another distinction, we would say that science deals with effects, and from them builds her temple; religion goes to the cause and origin of all, and, in her highest form, bestows the ineffable delight of communion with the First Cause, the beginning and centre of the world. All are familiar with Paley's famous illustration, in his Natural Theology, of the watch, as an indubitable evidence of design. If there be a watch, it is clear there must be a watchmaker. But if we could see the watchmaker himself, and become acquainted with the motions of his mind, we should have a more satisfactory knowledge than by examining all the works of his hands. Religion, in her highest office, carries us beyond the *works* into fellowship with the *spirit* of God. In this vital fellowship, there is a persuasion and happiness, a motive to effort and a comfort in trial, which no study of nature, no investigations of human science, can afford. So those most profound in science are most ready to confess and declare. When religionists on the one hand shall be delivered from sectarian dogmas, and the whole school of science on the other from resting in second causes, the gospel of Christ will, with the providence of God, freely produce this experience, and vindicate it as the most blessed of facts.

We may seem to have been drawn away from our author by this train of general discourse. But we have been only as a fellow-traveller with him in his own frequented paths. We have been but measuring out some of the foundations of his work, and breathing the familiar spirit of his thought. We have the more willingly taken his labors as an opportunity for these reflections, because there is little need of an extended special criticism of this new edition of his book. He is no aspirant for public favor, whose fortunes might be in any manner determined by what we should say, but an accepted teacher, with an established position before the whole reading as well as the hearing community. As a valued contributor to our own pages, and a minister in many ways, far and wide, of the spirit of the gospel, his claim is amply acknowledged. Not a word we could utter is needful to set forth the pure and

lofty character of his entire influence. The train of thought we have been pursuing is the best index we could make of the intellectual and moral stand he has taken, and the truest commentary we can offer on the doctrine and spirit of his last publication. In a time of bold skepticism, and in a quarter where unbelief dealt her fiercest blows, he has stood forth as a defender and expounder of the Bible. While a new naturalism has been introduced among us, and what is almost the worship of general laws has grown into a fashion, he has lifted up his voice earnestly in the cause of supernatural truth. We have to thank him for his fidelity to the gospel he was set to maintain, and for his large services in its pure promulgation. Though having no lack of decision and candor as a theologian, he has never ground in any sectarian mill, but has published his convictions for the good of the whole church, with the freedom and breadth of Christian faith. In so doing, he has shown his respect to that simplicity and godly sincerity, which, combined with a catholic love, alone can tend to unite believers of every name in one great communion.

The tone of this volume of "Christian Consolations" is one eminently of good-will and holy fellowship with all; and, while bearing throughout the stamp and color of an affectionate sentiment suited to its design, it equally shows the rare ability to carry deep into the soul the comforts of which it treats. Its style is one of signal clearness and vigor, and, being also rich and suggestive, is yet never mystical or obscure. Dealing with the highest religious feelings of which human nature is susceptible, it never fades into indefiniteness, or is lost in the clouds. A calm, poised, convincing energy of argument is the writer's characteristic. Every sentence is marked with the individual genuineness and originality of the meditation from which it springs. He works in no narrow space, upon the corners and angles of subjects; he spins no attenuated threads, but leaves the tokens of an easy strength and a broad, massive handling on all his themes. We have in him the peculiar pleasure always received from a quiet, harmonious exercise of the complex faculties of reason, memory, fancy, and religious faith. He rarely emits sudden flashes of inspiration, but is ever warming into a steady glow. He rises seldom with quick flights to Himmaleh summits, but walks on a high table-land with a sustained evenness and force, in which

he has few companions. His sermons are models in the plainness of their views and the power of their expositions. They are a breaking of the simple bread, and a pouring out of the water, of life. He has no ambition to get beyond the common truth, of which he is a herald, into any ingenuities of his own speculation; yet, through all that is trite in the principles he urges, come forth fresh applications and moving appeals; and we have felt continually, in going through his book, how the wholesome and sufficing spiritual nourishment he affords never "puffs up," but only "builds up" the soul.

Some may think his book should not be called one of "Consolations," it occupies so widely the field of Christian truth. But we think he has judged wisely in adapting so many topics to this one purpose. We wish it were more generally understood, that the consolation of the afflicted does not consist merely in soothing words, or in sympathy, however sincere, expressed in modulations of the voice; still less, in harrowing up the feelings by dwelling on the sad outward particulars of grief and woe; but in the unfolding of all God's inspiring and glorious truth to the spirit of man. For there is not a doctrine of his word, and not an attribute of his character, which, properly considered, is not consolatory. Nothing need be hid of the proportion of his revelation, but all displayed, to lead the sorrowing to the best resignation, to a clear cheerfulness and abiding peace. It is not merely smooth and quieting suggestions, as if we were hushing a child to sleep, or pleasing it with toys, that will give serenity and joy to the disappointed, the destitute, or the bereaved; but only a presenting of that divine reality on which they can depend, — that "substance of things hoped for, and evidence of things not seen," which informs the mind, quickens faith, stirs the conscience, gives a zest to grief itself, and stimulates the whole spiritual nature to that more distinct vision of a better world, from which the troubles of earth pass away unseen and forgotten.

But we must hasten to justify our remarks by some extracts, which, we hope, will lead our readers to the book from which they are derived. Take the following from the sermon on the need of the Father.

"We feel, it seems to me, peculiar need of a Father in heaven, in our communion with the fair and glorious scenes of

nature. Did you ever see a little child taken by his father to see some glittering pageant, which seemed to the child immensely vast and grand? And have you not marked how the child will at short intervals look away from the gay show to his father's face, as if to fortify himself by a glance of love? And, in these glances, does he not tacitly confess himself dazzled and bewildered by the sight, and able to look upon it only as supported by his father's eye? Not unlike emotions many of you must have felt, when you have stood by the ocean or on the mountain-top, or when you have considered the heavens, and beheld the stars, as 'at the commandment of the Holy One they stand in their order, and never faint in their watches.' You have felt bewildered and lost, lonely and desolate; you have been overwhelmed by a sense of vastness and immensity; and a silent, shuddering awe has come over you. These emotions are the child's yearning for the father's eye. You feel thus, because you cannot support the consciousness of solitude and desertion in the boundless universe. You cannot bear to find yourself mere atoms in the outward creation, filling a smaller place in the great sum of being than a single leaf in the forest or a drop in the ocean, unless there be revealed to your distinct consciousness One who numbers the hairs of your heads and the sands of your lives. Were I an atheist, I would cut myself off from every grand view of nature, would shun the mountain and the ocean, and shut my eyes against the crimsoned sunset and the gemmed vault of night; for all these things would tell me what a solitary being I was, and how unsheltered; — they would speak to me of a stupendous machinery beyond my control, of gigantic powers which I could not calculate, of material forces which my boasted intellect could neither comprehend nor modify." pp. 5 – 7.

With what brief but striking expression is our Lord's example of "Patience" portrayed!

"The Jew gives him over to the Gentile; the Gentile hands him back, scourged and buffeted, to the Jew; and the Jew again transfers him, lacerated and mangled, to the foreign executioner. But, beneath their jeers and taunts, tossed from one coarse hand to another in the crowd, grasping the mimic sceptre, with his temples torn by the thorns, he wears in his unmoved serenity a kingly aspect, which strikes admiration and awe into many rude hearts, and constrains the man of blood, who watches by the cross, to exclaim, — 'Surely this was the Son of God.'" p. 22.

The sermon upon "Memory" strikingly shows how the unexaggerated statements of a thoughtful observer may thrill through the breast.

"I would first remark, that there is abundant reason to believe that memory never loses any thing, but that it retains, and may reproduce, when the right string is touched, every thought, impression, and event of our whole past lives. The well-ascertained phenomena of delirium, insanity, and other unusual forms of consciousness, furnish ample demonstration of this statement. In these conditions of mind, it has been found that the most minute and remote circumstances, complex trains of thought, series of words or musical notes, words even in an unknown tongue, have been recalled after an interval of years, and flooded the soul with its rememberings. In our usual state of mind, things do not indeed return to us uncalled, nor yet do they come at once when sought, but obey certain laws of suggestion or association, which retard the action of the memory, as the balance-wheel does the movements of a watch. But in the modes of consciousness now referred to, the balance-wheel is taken off, the usual laws of suggestion are suspended, the full flow of memory takes the place of the scanty jet of recollection, and the whole past rushes spontaneously upon the mind, foreshadowing the day when death will snap asunder the earth-spun threads of association, and pour the accumulated treasures of the past into the lap of the boundless future." pp. 76, 77.

"In seasons of sorrow, the past always utters its voices. At such times God brings every work into remembrance, and enters into judgment with our spirits. When the hand of Providence is heavy upon us, if the past has been stained with guilt, we need no inscription upon the wall to make our knees smite together and our souls tremble. The handwriting is upon the fleshly tablets of the heart,—'Thou art weighed in the balance and found wanting.' There is nothing more true to universal experience than the self-reproaching communings of Joseph's brethren, when they felt themselves surrounded by imminent perils in a strange land. Their memory glided over the long period for which they had led self-complacent and generally dutiful lives, and rested on the one damning sin of former years; 'and they said one to another, We are verily guilty concerning our brother, in that we saw the anguish of his soul when he besought us, and we would not hear; therefore is this distress come upon us.' A vast amount of remorse mingles with human grief, and drugs to the utmost with gall and wormwood the cup of sorrow. When ill-gotten and ill-used wealth departs, the remembrance of numberless breaches of good faith and charity arms penury with a scourge of scorpions, which she never wields when she enters the dwellings of God's chosen ones. When the unfaithful and unloving are separated by death, with the sorrows of bereavement there

blend the embittering recollections of violated duty, variance, and discord." pp. 79, 80.

We must take a striking period from the sermon on the "Memory of Grief and Wrong."

"Take away, my friends, from our religious union all that has borne a sad aspect, — our mutual counsel and consolation in doubt or sorrow, our united prayers by the bedside, our last joint offices of piety over the dead, our intercessions for one another in the sanctuary, — there would be little left to unite us, little reason why we should worship and commune together, and we should fall asunder as isolated human units, each to feel out his own solitary way to the grave and to heaven." pp. 340, 341.

From the sermon on "The Communion of the Dead with the Living," we take the closing passage.

"To my mind there is hardly a text of Scripture, or form of speech, that rolls on with such a depth and fulness of meaning as those words, — 'Seeing that we are compassed about with so great a cloud of witnesses.' Vast and bewildering is the philosophical speculation which tells us that we cannot lift a finger without moving the distant spheres. But far more grand and unspeakably solemn is the thought, that our daily lives, our conduct in lowly and sheltered scenes, our speech and walk in the retirement of our homes, are felt through the universe of ever-living souls, — that the laws of attraction and repulsion that reach through all orders of being, extend to our least words and deeds, — that in every worthy, generous, holy impulse, all heaven bears part, — that from the trail of our meanness and selfishness, our waywardness and levity, all heaven recoils. Let the august witnesses, the adoring multitude, in whose presence we dwell and worship, arouse us to growing diligence in duty, and awaken in us increasing fervor of spirit, that we may run with patience the race that is set before us, and, found faithful unto death, may receive the crown of life." pp. 352, 353.

We make no apology for the space which, among our secular topics, we have given to the notice of this truly religious volume, and to subjects suggested by it. In a purely literary view, for the lovers of just thoughts in beautiful apparel, "apples of gold in pictures of silver," it would deserve all commendation. But literature is an expression of life. And life is a scene whose glad experience so much disaster clouds, that if there be any steady light of comfort not subject to eclipse,

any heavenly brightness for the benighted soul of man, when the sun and stars of earthly hope are no longer seen, the blessed beams should be sent in every direction and reflected from every page. Unspeakably grateful are the many springs which God has opened to quench the thirst for knowledge. But how often, in anguish of mind or conscience, in sickness, grief, and the shadow of death, is there a craving they all cannot satisfy, and when they seem but as vinegar and gall to parched lips. To every man must come the evil days, wherein is no mortal pleasure; when the structure of the material world, from starry heights of immense space to subterraneous phenomena measuring inconceivable time, — when the history of the past, its unburied cities, strange inscriptions, and wondrously preserved forms and hues of art, — will have no interest; and when the changes and revolutions of the present, too, will go by, like the earthquake men heeded not in the sore extremity of the battle. And when the tongues of this world thus lose their charm, and all its knowledge vanishes away in weakness and insufficiency, for nothing shall we render such thanks as for whatever suggestion has opened our ear to the voice of comfort and good cheer from above. The book that does this shall not fail of its honor.

The whole benefit, which our author intends, can be received only from the study of connected pages in serious or sorrowful hours. We have occasion to know of the blessing at such seasons he has wrought. May his work proceed long and far in the effectual discharge of its kindly errand! May it visit many an abode of anguish, be a welcome companion in chambers of sickness, and, in the mourner's solitude, where the world would be an intruder, enter as with an angel's presence! May the tears cease and dry up in many eyes that read it, and the groans no more be heard, or secret sighs heaved, from many bosoms that shall have pondered its lessons! If the death-bed is cheered by it, and the grave illumined by the rays it reflects from heaven, its author's desire will be fulfilled.

ART. V.—1. *Elements of Natural Philosophy; being an Experimental Introduction to the Study of the Physical Sciences.* By GOLDING BIRD, A.M., F.R.S. The Third Edition, revised and enlarged. London: John Churchill. 1848.

2. *Elements of Physics.* By C. F. PESCHEL, Principal of the Royal Military College at Dresden, &c. Translated from the German, with Notes. By E. WEST. London: Longmans. 1845–6. 3 vols.

3. *Lehrbuch der Physik und Meteorologie.* Von DR. JOH. MÜLLER. Als dritte umgearbeitete und vermehrte Auflage der Bearbeitung von Pouillet's Lehrbuch der Physik. In zwei Bänden. Mit gegen 1200 in den Text eingedruckten Holzschnitten. Braunschweig: Friedrich Vieweg und Sohn. 1848.

4. *Grundriss der Physik und Meteorologie.* Von DR. JOH. MÜLLER, Professor der Physik und Technologie an der Universität zu Freiburg im Breisgau. Zweite vermehrte und verbesserte Auflage. Braunschweig: Friedrich Vieweg und Sohn. 1850.

5. *Principles of Physics and Meteorology.* By J. MÜLLER. First American Edition, revised and illustrated; with 338 Engravings on Wood, and two Colored Plates. Philadelphia: Lea and Blanchard. 1848. 8vo. pp. 635.

FEW persons, we presume, at the present day and in this country at least, are disposed to deny that scientific culture and, as one of its elements, instruction in physical science, should hold a place, and not an inconsiderable one, in every system of education. It would not, perhaps, be wise to insist that the amount and the kind of instruction in physical science should be the same for all minds, whatever their innate characteristics, and however different their destination. We believe, nevertheless, that, at an early age and until the mind begins to act for itself, less modification of the general scheme to suit individual peculiarities is demanded than many seem to suppose. And this we say, not because we desire to thwart genius, or reduce to a dead level the manifold inequalities of intellectual gifts, but because we believe that

the symmetry of the mind gives it its best strength, and that an unbalanced mind will make shipwreck of its treasures, however richly it be freighted.

We know there are those who, after they have divided the whole period allotted to an academical education equally between the many various branches which are promised to be taught, exclaim with earnestness, how insignificantly small, how utterly inadequate, is this crumb of time which falls to the lot of any science for its useful acquisition, or even for a proper appreciation of it! How much better would it be, that the student should devote himself exclusively and passionately to one, or, at most, to a very few, of these branches, rather than, in the vain hope of not losing one, to fail in the whole! They forget that the whole period of education at school or in college is not equally divided in this way; that many branches, as, for example, the ancient languages and the mathematics, are begun early and studied perseveringly, and are discontinued at a late day; and that these, if not exhausted, as indeed they cannot be, by the undivided absorption of a life in their pursuit, are at least mastered. Of other branches of knowledge, such as the chemical and physical sciences, philosophy, ethics, history, and the rest, all which are crowded into a very narrow period by the preference given to those first mentioned, the remark is strictly true, that this time, so short in itself, is almost annihilated by the divisions and subdivisions which are made of it. But our own experience and observation persuade us, that this time, broken into so many fragments, is not frittered away; that the student obtains a general view of the boundaries of human knowledge; makes the first rapid, preliminary survey; clears away some of the rubbish which intercepts his steps; wipes out from his eyes a part of the mist which dims his vision, and, in science at any rate, breaks the ground. However small a thing this may be, when contrasted with the lifelong acquirements of giants in their favorite walks of science or literature, it is still much when compared with blank ignorance. For, next to the acquisition of any branch of knowledge, the best thing and most to be desired is, to know that it exists, in what books it may be studied, how far its horizon stretches, and what place it occupies in the wide realm of related sciences. If the time

for all these studies is so small, instead of consenting so readily to elect a few and drop the rest, why not strive with energy to increase the period of education? Why not enlarge the course of college education by one or two years, and that of school education in the same proportion; and above all, why consider that the whole of education is accomplished when either is gone over?

To achieve such a radical reform as this, which would remedy some of the difficulties experienced by those who teach, it is necessary that a vigorous effort be made to withstand the strongest tendencies of the young, especially in this age and country, — an impatience of long and unfaltering toil for a postponed advantage; an intolerance of control; an eagerness to put on the harness of real life, and a boasting when it is put on, as though it were taken off, after the strife was over and the victory won. Strange is it, that now, when the boundaries of human knowledge are so much enlarged, circle outspreading and surrounding circle, like the ripples on the sea, — when science is constructed and extracted from the passing phenomena of nature, when it comes to us in such solemn accents from the bosom of the earth, when it speaks to us out of the heavens so beautifully and so accurately, — no more time should be thought necessary to ponder upon all these things than was given to the education of the young centuries ago, when books were so rare, and all that was then known of some which are now the richest sciences could be told in a single breath.

In the intellectual as in the material world, there is one kind of strength (the best strength of the mind) which time only can bestow. This strength comes not from brilliancy of parts or from indefatigable exertion; it is the gift and ornament of age and maturity. How many at the present day have bidden farewell to their places of education before that strength has come into their minds? And yet, that strength of mind is indispensable for the comprehension of abstract science, and for the successful study of other very important branches taught in our schools and colleges. Hence the complete failure of many, even brilliant in all their other studies, when they advance prematurely upon these unfamiliar fields. Hence the regret which, not seldom, falls from the lips of those who have left their days of pupil-

age far behind them, that their minds were not opened then to the truth and beauty and attractiveness of studies with which their full-grown intellects are in love, but which then were accounted dry, because they were not, and could not be, understood by them.

How any considerable extension of the period of education is to be effected, it is not easy to discern. When we see, every year, young men anticipating the customary termination of time studies, curtailing the period, short as it appears for the duties which belong to it, and hurrying to take leave of the retreats of the academy, that they may get the start by a few weeks or months of their companions; when we see them reconnoitring in their professional studies, beginning to teach others, embarking in trade, or putting out their hands for the gold of California, before they have yet earned or received their diplomas, how can we expect to restrain the impatience of even the most scholastic for an additional service of two years in the schools? How can we expect that the gentle persuasions of sound education, good learning, and profound science will be heard above the din of the world without, and the fever and passion of the world within? Difficult as it may be to accomplish a reform so much to be desired, who that takes pride in the character of our places of education, in the originality of our literature, in the accuracy and depth of our science, in the success and happiness of our young men, and in the honor of the whole country, is not ready to pray for this reform, to watch for it, and to labor for it?

Every day the struggle is growing more and more intense for the honors of life between those whom our colleges educate and those whom the world educates; between professional men and practical men, as they are called. There can be no doubt that the world educates men thoroughly in what it professes to teach. Colleges must do the same. They need not aim to be less scholastic, or to teach what the world teaches; but they should teach perfectly after their own idea. Otherwise, the world will educate the most useful members of society, and college men will fail of their share in the honors and emoluments of life. What man of science, however much he may glorify his profession, does not consider a thorough practical acquaintance with any art as both more useful and more dignified than a superficial

knowledge of the laws, principles, and theories of science. Patient instruction by the worst system is certainly better than careless instruction by the best system. Already there are springing up in various parts of the country practical schools of science, which profess to teach that which comes nearest to what the world teaches. We wish them all success; we doubt not, that if they are true to their idea, they will render an acceptable service to the cause of education. But let not those who frequent them be deceived. Let them not expect, after a few months of study and experiment, to go forth into the world and displace those whom experience and the arts have been teaching their lessons of science for years. If they are persevering as well as diligent, they will have their reward. But without both diligence and perseverance, they will know but in part the scientific truths which the artisan and the manufacturer have distilled from their daily pursuits.

The inquiry is always a serious and interesting one, in what way any province of human knowledge may be best opened to the mind of the student. The inquiry loses none of its interest or importance when it is made in reference to the more difficult subjects of instruction. In the difficulty, bewilderment, and frequent dismay which they occasion to the young, the physical sciences will take rank of all the other sciences, and perhaps also of all other branches of learning, excepting the pure mathematics. The reason is, that the physical sciences involve the application of mathematics, and sometimes of its most subtile and intricate departments. And who does not know that the application of any knowledge to the problems for which it is suited is harder than to acquire the knowledge; that it is verily the severest test of the question whether this knowledge exists in the mind in clear and distinct outlines. This application implies, not merely acquaintance with a truth, but familiarity with it, in its principle and its details. Moreover, the same rule holds good in mathematical as in moral reasoning. The soundness of our conclusion depends not merely on the exactness of our logic, but also on the correctness of the premises.

Whoever begins the study of physical science without some knowledge of geometry, and the algebraical and infinitesimal analysis, will find himself confronted at every step by

an imperious call for this sort of preparation. The physical student needs the helping hand of mathematics to expound to him the theory of the instruments which he uses; he needs them in his investigations into the physical laws of the universe, and he needs them none the less to express those laws after they have been discovered. If not only the sober planets, but the nomadic comets, tread so precisely in their prescribed orbits as to test the precision of pure geometry; if it be true not only in the heavens, but in all material nature, that God geometrizes in it and through it; if He, not merely by his providence, but by his geometry, rides on the whirlwind and directs the storm; if sounds rush through the air, if the tides ebb and flow, if the waves rise and sink and spread, if the finer essences of heat, light, and electricity radiate, interfere, and flash in harmony with the most profound mathematics; if even the trees, shrubs, and weeds bud and branch and blossom according to mathematical formulas which the Almighty has copied from the grander works of his own creation, — ought not the humblest student of the physical sciences to have a taste of that divine geometry which filled to overflowing the minds of the great seers and prophets of nature? We have no disposition to deny the intrinsic difficulties of the pure and mixed mathematics; we think, nevertheless, that a tendency exists to exaggerate these difficulties, and also to make of too much account what is considered a primitive bias for or against these studies. There is, certainly, this peculiarity in the case. It is not possible to use the language of mathematics without understanding the associated idea; it is not possible on this subject to darken counsel by words without knowledge. The consequence is, that those who do not understand a mathematical problem are themselves the first to know their own deficiency. But is it always so in other things? In other subjects, does not a want of clear conceptions sometimes exist where there is no lack of fluency? It may well be doubted, whether the mental labor which the mathematician expends on his most difficult problems differs either in quality or intensity from that which the statesman, the moralist, or the philosopher, incur when they master the deep questions relating to politics, ethics, or the human mind.

A foundation for physical knowledge being laid in a good mathematical education, another interesting inquiry is sug-

gested as to the best method of imparting instruction in the physical sciences; whether by lessons from a text-book, or by oral lectures, or by the two united. In our opinion, there are few, if any, branches of knowledge which can be taught to advantage exclusively by oral lectures. Certainly, the physical sciences are not of that number. At the same time, perhaps there is no subject in which such lectures are a more valuable auxiliary than in physics. Many of the physical sciences are in a state of rapid development. In some, we hardly know what a day may bring forth. Old lines of research are widened and lengthened, and new ones, intellectual Californias, are struck out and deepened with unexampled rapidity. The text-book, be it ever so complete when it is written, may grow obsolete before it has left the press. Lectures, therefore, are a valuable handmaid to the written and printed page. They are the fit vehicle for new discoveries, for the discussion and elucidation of questionable theories, for historical anecdote, for biographical sketches of the great interpreters of nature, and for experimental illustration. For these and other such purposes, lectures are not only useful; they are indispensable. But to fulfill these purposes, lectures must not be written. They must come from the present studies and reflections of the teacher, and give, as in a daguerreotype, a faithful image of the passing history of science. To this end, if written, they must be rewritten every year; but as this is not to be expected, they must not be written at all. Hence they will be loose and discursive, and require to be corrected in their details by the carefully prepared statements of the text-book. They may illustrate, therefore, the text-book, but they ought not to supersede its use. We would not lose sight of the magical effect which may sometimes be produced upon the young by the living voice of the lecturer. If there be any one whom nature has gifted with the eloquence of science, let him lose no opportunity to charm and instruct by it. For it may be the spirit which maketh alive, while the printed page is the letter which killeth. But let not even such a one deny or disparage the different merit of the select text-book.

Some degree of the embarrassment which the young experience in the study of mathematics originates, we are persuaded, in an organic defect of vision for solids of three

dimensions; a deficiency which has not been supplied by familiarity with the principles of perspective geometry. It is now well understood, that the eye possesses the power, only within very moderate limits, of measuring the distance of an object which it contemplates; and that it is often, on this account, at a loss in assigning the correct position to a line or surface, the several points of which are at unequal distances. When the dimension of a solid measured in a direction parallel to the visual ray is small compared with its distance, the parts of the body turned towards the eye are too nearly at the same distance with the opposite parts, and the visual rays passing from the borders of the body to one eye are too identical in their arrangement with those which enter and paint their picture on the other eye, to furnish any satisfactory data for deciding which of two possible positions the body occupies; so that the mind oscillates unquietly between the two, however intently the eye attempts to fasten one and expel the other from the imagination. This optical delusion is a matter of common experience, and admits of a philosophical explanation. This instability of vision, which sometimes is experienced in looking at a distant solid body, is still more likely to arise when we look at a picture of it in outline, unrelieved by shading. Who can doubt that we have here one source of the confusion worse confounded of the young student of geometry? He draws his diagram upon the blackboard, or he gazes upon it on the leaf of his text-book, and as he hopefully advances in his demonstration, his eyes swim, the figure jumps from one position to another, and soon his mind is confused, and he gives up in disgust. We believe that the failure of the young to master solid geometry originates as often in this organic peculiarity of vision, existing to excess, as in any deficiency purely intellectual. We believe that a geometrical eye is quite as indispensable to the success of the mathematician as a geometrical mind. The student who pores over perspective delineations, in order to decipher the construction or position of a new philosophical instrument, or of the mechanical arrangements of a novel experiment, encounters a difficulty similar to that which puzzles the young geometrician. Hence the importance of maps in relief for those who would understand the geological and topographical features of the earth; of model solids for

those who would not be defeated in their geometrical studies; hence the value of at least one glance at the various complicated instruments of research, either in their full working dimensions, or in miniature, for those who would not be wholly cast down in the study of astronomy and the physical sciences. Hence the necessity of furnishing the experimental illustration as nearly as is practicable at the same time that the instruction is given from the text-book; or, at least, of placing before the eye of the pupil the instrument delineated in his book, when he is called upon to study and describe it. It may be thought that too much assistance of this kind relieves the pupil from intellectual exertion, and defrauds him of the energy of mind which constant, strenuous exercise imparts. We, too, admit that there is, in general, a limit to the facilities for learning that should be granted to the young. But, in our opinion, all the relief that can be contrived is only sufficient to carry many a student over difficulties in the pure and mixed mathematics which would otherwise be insurmountable.

There is still another view which we would present of the advantage of instructions from the text-book, illustrated by oral lectures, over the exclusive adoption of either of these methods of teaching. Lectures are an excellent discipline to the teacher. They require him to concentrate his thoughts, to make up his mind on doubtful scientific questions, to inform himself thoroughly in the literature of science, to acquire a skill in manipulation that will qualify him for original investigations, and, finally, to look at the whole subject of physical science less in detail, and more as the harmonious working of a single creative mind. Now, who does not see that a part of these advantages are realized by the student who recites from a text-book? He is not a passive recipient merely. His mind is exercised not only on the subject of his studies, but on the best way of expressing with propriety what he has learned.

In urging, as we have, the preëminence which belongs to instructions from the text-book, we have assumed that these text-books were of the best kind; well arranged, accurate, clear, and frequently remodelled, so as to exhibit the passing phases of science. We may venture a doubt whether the text-books used at our schools and colleges always come fully

up to these high conditions. Many are so ambitious of authorship, that they must write a book at all hazards, however unprofitable it may turn out to themselves or to others. Moreover, a teacher, who begins to experience the imperfections of the best text-book which he can procure on any subject, naturally concludes that his only remedy is to make one for his own use. If he surpass his predecessors in the same field, it is well. If he fall short of the goal which they reached, he has done more harm than good. Let no teacher be too confident that he will escape faults into which others of much higher qualities of mind have fallen; or, if he should, that he will not commit mistakes of his own equally injurious. Let him reflect that he can, by his method of teaching, supply the defects of any text-book; and that, whenever he does so, the pupil is brought into contact with two minds instead of one. As things now go, the few who are best qualified to write find no pecuniary temptation to embark in the unprofitable enterprise. Particular institutions are pledged to the use of particular books. Each college, each sect, each publisher, is interested in his own series of text-books, and labors to increase their circulation. In the eagerness of such a competition, it is not certain that the best will acquire the ascendency. It may sometimes happen, that the one which is sustained by the strongest sect or the largest capital will prevail over another which teaches better science. Moreover, the American publisher prefers a foreign work, which costs nothing, or at most only the expense of a translation, to domestic authorship, however deserving, and however superior to that which is *borrowed* from abroad and never to be returned. We are far from wishing to curtail the literature of science. We do not desire to see all drinking from the same fountain, be it ever so copious and salubrious. We would look at this outward universe, and take care that others look at it also, from many points of view; and supply the deficiencies of one mind by the excellences of others. We would see the standard scientific works in every language translated into our own tongue, and made accessible to the American student. We would not confine any teacher or any institution to the exclusive use of any single series of books, however good. For the sake of the teacher as well as the pupil, we should prefer frequent changes in the text-

books; so that, if no single student or class of students were able to compass all, or more indeed than a single one, a succession of classes might be the depository of the treasures of all; and thus the whole neighborhood, the city, the state, the country, which are fed by this common stream of educated men, partake of a more liberal culture and drink from clearer and deeper fountains.

A good text-book should be comprehensive in its general plan and very exact in its details. It should be written in an accurate and clear style, and, what is equally important, it should be printed in a distinct type. Some of our reprints of foreign scientific works have greatly offended against this last requirement, and deserve severe censure for it. Such books ought not to be placed in the hands of the pupil; for not only do they tend to ruin the eyes, but they oppress the imagination, and cast their own lurid light into the darkness which may hover over the subject itself. Equally contagious is the brightness of the pure white sheet and the clearness of a bold, generous type; by its light even a difficult subject seems transparent. So rapid has been the growth of modern physical science, that no work, however voluminous, could contain the half that might be written. The author who assumes the task of making a text-book is required to use great discretion, and to exercise a happy judgment, in selecting what is most essential, not forgetting to interest while he aims to instruct. The writer cannot confine himself to the naked principles of physical science; for at present these are not numerous. The literature of science does not consist chiefly in the great laws which have been discovered; but in the history of discovery, in the instruments of research which have been contrived, in the facts which suggested, and the experiments which illustrate, general laws. We prefer, as a general rule, the synthetic method, which in point of time travels backward, planting first the great principles and generalizations of any science, building on them as a foundation, and deriving the scattered phenomena of nature as branches from the central trunk. There may be cases in which the analytical method may be called to the assistance of the former method. For, although less easy, it has the advantage of conducting the pupil through a process of thought not unlike that which warmed the

minds of the original discoverers; and thus associates with the principles of science its history and the laws of discovery. Finally, no pains should be spared by the author and teacher to hold before the mind of the student, and to keep there, the unity of nature, and the intimate connection of the physical sciences as they stand out before the mind of the Creator, however disjointed and fragmentary they sometimes appear to the imperfect reason of man.

While the recent scientific literature of France is adorned by the general treatises on physics of Pouillet, Lamé, Peclet, Pinault, Becquerel, and Despretz, the English language can only boast of the works in Natural Philosophy by McGauley, Olmsted, and Bird. Of course, we are not speaking of school-books, but of such works as might be appropriately used by advanced students in college. General physics, as treated by French writers, exclude the pure science of mechanics, as well as algebra and geometry, and only admit their application to physical problems. In this view of the subject, physical astronomy is a part of physics; but on account of its magnitude, it is not discussed in works on general physics, but either in a distinct work, or in connection with mechanics; of whose fundamental principles it often furnishes the most convenient and splendid illustrations. The English treatises enumerated above are constructed upon the old English model. Natural Philosophy, as limited by usage in this country and Great Britain, comprehends a part of what the French writers style *physics*, and, in addition, the science of mechanics. These books contain, therefore, the doctrine of forces, in its twofold relation to statics and dynamics, as well as the application of the general doctrine to the physical forces. To make room for mechanics, a part of what truly relates to physics is dropped out of English works on Natural Philosophy, and is adopted by the chemists in their books. In our opinion, the English division of the sciences is less philosophical than the French.

We do not expect that a work like that of Dr. Bird, condensed into a single octavo volume, should compete with the more comprehensive treatises in the French and German languages, which are expanded over two or three volumes. We may, notwithstanding, express our astonishment that the demands of scientific education in Great Britain and in this

country are no higher than what can easily be satisfied with such compendious and elementary productions. We are aware that the works on physics in foreign languages, especially in French, are extensively read by scientific men in this country, and, we presume, in Great Britain also. Still it would appear that the demand for these or similar treatises is too small to provoke original works, or even translations of the foreign ones, except in one or two instances.

This deficiency in one department of English scientific literature is partly explained by the fact, that the talent (and it certainly has been of a high order) which might have been exercised in this way has been preoccupied in writing monographs in science for such series of publications as the Cabinet Cyclopædia, the Library of Useful Knowledge, the Penny Magazine, and the Encyclopædia Metropolitana. Of some of the papers contained in these valuable depositories of science, too much cannot be said in praise; they adorn the sciences which they are written to illustrate. The article on Light, in the Encyclopædia Metropolitana, by Sir J. F. W. Herschel, is unsurpassed by any thing which has been written on the general subject in any language; and, if published separately in an accessible form, as it is in Quetelet's French translation of the original, it would be very useful to advanced students in that subject as a text-book. The same work contains a paper on Sound, written also by Herschel, in which the remarkable labors of Chladni, condensed into his *Traité d'Acoustique*, are introduced to the English reader, and the more recent labors of Savart and Wheatstone in the same field are infused into the popular science. The American reprint of this paper, in an abridged form, with some modifications in the statements and explanations, has supplied a convenient text-book, better adapted to the purposes of instruction than Higgins's Philosophy of Sound. The article on Physical Astronomy in the Encyclopædia Metropolitana, by Herschel, and another, on the Figure of the Earth, by Airy, are not designed for elementary use. The articles on Electricity, Magnetism, and Electro-Magnetism, by Barlow, are less satisfactory than those on the same subjects by Roget, in the Library of Useful Knowledge. The latter publication contains also articles on the other branches of physics as well as astronomy; but most of them are too

popular to be recommended to our academies or colleges. In the Cabinet Cyclopædia, astronomy, mechanics, physics, and chemistry are treated in a liberal number of volumes. These treatises, in their present form, are, perhaps, better adapted to academical use than any thing else which can be found in the scientific literature of Great Britain. Still, they are far from being unexceptionable in their plan or execution. In general, they are of too popular a character, and moreover, being prepared by different authors, they want that unity of thought which should run through a general treatise on physics, and which is necessary to imprint upon the mind as well as the heart of the student the great fact, that, though man studies the universe in detached views, God created it and moves it as one grand whole.

Herschel's Astronomy, which makes one volume of this Cabinet, did not certainly satisfy the high expectations excited by his elegant discourse on the study of natural philosophy, which had charmed the world a few years before, from the same Cyclopædia. The literary style of Herschel, though often beautiful and eloquent, is highly involved, and forcibly reminds one of the German origin of the writer. This ornate, elaborate, and dignified diction, which appeared graceful and impressive in his stately discourse just mentioned, is singularly out of place in the treatise on astronomy, where the multiplicity of words, the length of the sentences, and the rhetorical flourishes, perplex the student and mislead him from the subject. The chief difficulty in the study of astronomy is to form a graphic conception in the mind of the physical fact. We doubt whether this conception is so strongly suggested by highly ornamental language, with which wholly different ideas are usually associated, as by the simple lines and the brief and severe definitions of geometry. Nevertheless, we have always regarded the chapter on perturbations as a triumphant effort to render into common language, and illustrate by familiar analogies, difficult points in the celestial mechanism, which, to be altogether understood, require the highest order of mathematical taste and attainment. This part of the book has been still more carefully labored in the recent edition, which has appeared under the new title of the Outlines of Astronomy; and, if studied in connection with Laplace's *Système du Monde* and Airy's tract on Gravi-

tation, written for the Penny Cyclopædia, but previously published in a small volume for the use of students in the elder Cambridge University, it will supply an intelligible commentary on the most embarrassing department of astronomy, such as is not to be found in any other language, and open an easy way to a general comprehension of dynamical questions, which a discouraged student would otherwise approach with dismay and abandon in despair.

The volumes of the Cabinet Cyclopædia on Electricity and Magnetism are partly historical, and partly didactic. A mutual infusion of one element into the other would be more suitable for a text-book than this bold demarcation. The first volume, by Lardner, is well arranged and well written; the second volume, begun by Lardner and finished by Walker, is a compost, in which some of the materials are good, but the whole is poorly digested. For those who desire to pursue experimentally the subject of electro-dynamics, Davis's Manual of Magnetism will be preferred to any other elementary work. Of the treatise on Optics in the Cabinet Cyclopædia, we can speak from a long experience. Justly distinguished as its author, Sir David Brewster, stands in this department of physical science, his strong bias in favor of the Newtonian or corpuscular theory of light disqualified him for writing a useful text-book on the subject. The obscurity which rests on all those portions which relate to double refraction and polarization originates in the false views of its illustrious author in regard to the mechanical character of luminous radiations. A large part of physical optics is a sealed book to most students. Much of the confusion is created by the improper terms which are used in describing the phenomena; terms which were selected at a time when the mechanical interpretation of the phenomena was erroneous. Who will not hail the appearance of a book in which the geometrical, as well as physical, laws of optics are explained on the undulatory hypothesis? Of course, we do not expect that elementary works should dip into the higher analysis by which the mysteries of optics are investigated and charmed out from their amazing labyrinths. We do not despair, however, of seeing a popular exposition of the doctrine of undulations, which shall bring the subject under the comprehension of all who are conversant with the elements of geometry, algebra,

and mechanics; and we have faith that some will be able to understand the intricate facts of physical optics from this point of view, who stumble over the explanations of Brewster and Biot, or of others who aspire to compound the two rival theories. English scientific literature, without any foreign loan, abounds in materials for such a work, graduated to any degree of abstruseness or simplicity. The admirable papers of Hamilton, M'Cullagh, and others, the celebrated tracts of Airy, all on the mathematical theory of light, the lectures and remarks by Lloyd and Powell on the wave theory of light, the lectures of Pereira on polarized light, the elementary optics of Brewster, Potter, and Wood, and, finally, the highly finished monograph of Herschel, to which we have already referred, contain the golden threads, already refined and elaborated, out of which a more beautiful and perfect fabric might be constructed. A work very recently finished in Paris by the Abbé Moigno, entitled, *Répertoire d'Optique Moderne*, gives a complete analysis of modern labors in relation to the phenomena of light, and, although not itself after the model of a treatise, would be very convenient and suggestive in the preparation of such a book.

We have mentioned the tenacity with which Brewster clung to the corpuscular theory of light, as an obstacle in the way when he wrote his treatise on optics. But the book is open to farther criticism. It lacks salient points, which the pupil may quickly discern and fix in his own mind. Sometimes, it dissipates in too great detail, and does not always hold the balance with a firm and equal hand between those discoveries and inventions to which time has given its sanction, and novelties which have only a passing, momentary interest. Great caution is necessary not to overrate the recent progress of science, as compared with its former advancement; since even the steps of a giant, if measured from a distance, would appear no larger than those of a dwarf or an insect. Without the precaution at which we have hinted, the time arrives which reveals palpably the injustice and partiality of an author, and the punishment, which is not long delayed, awaits him, that his book becomes prematurely obsolete. We ought not to leave this subject without remarking, that the American teacher has within his reach two other elementary treatises on optics, one by Professor Bartlett, of West Point, and the

other by Professor Jackson, of Union College, each of which is well adapted to the purpose for which it was intended.

Other works have appeared in England, within a few years, which are related more or less closely to physical science. Among these we will particularize Daniell's Chemical Philosophy, Carpenter's Mechanical Philosophy, and Moseley's Illustrations of Mechanics. Illustrations of other branches of Natural Philosophy, by the professors of King's College, have been long promised, but have not yet come.

It will appear from the rapid and partial glance we have cast at the scientific literature of Great Britain and this country, that there are in the English language the materials for a satisfactory text-book on general physics, and that very good works on special physical subjects and for particular uses already exist. Is it not time that the other want should be felt, or if felt, should be supplied? Is it not time that some one of the eminent explorers of physical science in Great Britain or this country, should do for the men of this generation what Young, Robinson, and Leslie did for the last, and produce a work on general physics which shall rival those of Peschel, Pouillet, Lamé, Peclet, Müller, or Regnault?

Let us see to what extent the want in question really exists. We know of no work, originally written in English, which embodies recent discoveries in physical science, and truly represents its present state, so well as Bird's Elements of Natural Philosophy. The first edition of this book was published at London in 1839. Its success is indicated by the fact that it was soon out of print, and a second edition was demanded in 1843, and a third in 1847. It is certainly a reproach to the physical science of those nations which speak the English language, to be indebted for the only prompt effort to diffuse its latest teachings to the necessities of a professional lecturer in Guy's Hospital, who, because he could not find in his language any work fit to be recommended to his pupils, set himself to work to make one. In the preface to the first edition, Dr. Bird gives the following explanation of his attempt at authorship.

"The best apology that can be offered for presenting this volume to public notice, will be found in the reason which suggested its compilation, namely, — the absence of any system of physics sufficiently extended to include all those subjects with which men

of education, especially members of a liberal and important profession like that of medicine, ought, and are required to be familiar with, and at the same time not too diffuse to disgust or weary the student."

Dr. Bird has given to his subject its widest signification. The general physical and mechanical properties of bodies, the laws of equilibrium and motion, when applied to the three great divisions of matter into solid, liquid, and gaseous, — the mechanical powers, — acoustics, magnetism, electricity, (mechanical, chemical, animal, magneto- and thermo-,) the geometrical and physical properties of light, polarized and unpolarized, optical instruments, thermotics, including the statical and dynamical laws of heat as applied to combined and radiant caloric, and photography, — all these subjects are fitly introduced, but they are treated with extreme brevity. Meanwhile the author has had his eyes wide open on the current movements in physical science, and the later editions have reaped the fruits of his enlarged studies and of the scientific activity of the age. We are gratified by notices, however short, of the researches of Melloni and Forbes, on radiant heat; of Herschel, Moser, Hunt, and Brookes, on photography and kindred subjects; of Dr. Davy, Faraday, and Matteucci, on animal electricity; of Breschet, Becquerel, and Crosse, on atmospheric electricity; of Grove, Smee, Bunsen, Daniell, Ohm, and Faraday, on voltaic electricity. We are astonished to find that there is room in so small a book for even the bare recital of so many subjects. Where every thing is treated succinctly, great judgment and much time are needed in making a selection and winnowing the wheat from the chaff. Dr. Bird has no need to plead the peculiarity of his position as a shield against criticism, so long as his book continues to be the best epitome in the English language of this wide range of physical subjects. He excels in those departments of chemistry and physics which come into close contact with the medical profession. The chapters on electricity, especially on physiologic electricity, are of this description. Voltaic electricity is presented in a form surpassed only by the admirable treatment it has received in Daniell's Introduction to Chemical Philosophy.

But Dr. Bird touches with a timid and unsteady hand other subjects, with which his favorite studies have not made him

familiar. His elements are particularly defective in those parts which involve geometrical conceptions, or require an accurate mathematical analysis to be so entirely understood that they may afterwards be correctly presented in other language. This criticism bears with force upon those parts of the book which relate to optics. For example, in paragraph 600, Dr. Bird, in attempting to explain the magnifying power of convex lenses, and the diminishing power of concave lenses, confounds the *border rays*, coming from the same part of an object as the central rays, with those which come from the *borders* of the *object*. Again, in the second part of the next paragraph, we read, "thus, it is evident, that in viewing an object through a lens, the longer the focal distance, the lesser apparent angle is it seen under, and *cæteris paribus*, the smaller it appears; whilst the shorter the focal length, the greater the apparent visual angle of the object, and the larger it appears." This is the reverse of what is true in reference to concave lenses.

We may take this opportunity of saying, that the simple rule ordinarily given for finding the magnifying power of a microscopic lens, — namely, to divide the distance of distinct vision by the principal focus of the lens, — will lead to confusion if it is applied to lenses in general. For, if the focal length of the lens were greater than the distance of distinct vision, the quotient of the rule would be less than unity, and the lens would diminish instead of magnifying, which is never true of any convex lens held close to the eye. The true principle may be stated in a few words. The rays which proceed from an object to the eye must fall within certain limits of divergency, in order that the object may be seen distinctly by that eye. This divergency decides the distance at which the object must be placed to be clearly seen; and this distance, determining, as it does, the apparent visual angle, fixes the visible size of the object. Any contrivance by which the distance of distinct vision is increased, is for the purpose of diminishing the visible size of the object; and any other contrivance by which this distance is diminished, serves to increase the visible size of the object. Concave lenses always make the emerging rays more diverging than the incident rays. Hence the object must be placed farther off, that the diminished divergency of the original rays may compensate for the

diverging action of the glass. Such a lens always diminishes. Convex lenses always make the emergent rays less diverging than the incident rays. Hence the object must be brought nearer, that the increased divergency of the original rays may check the converging action of the glass. Such a lens always magnifies.

In paragraph 603, Dr. Bird says: —

"On referring to the diagram of the course of rays refracted by a convex lens, it will be seen that the rays passing nearest the axis of the lens will be refracted to a focus at a greater distance from the glass than those which pass nearer the circumference. On holding a screen of ground glass near the focus of the central rays, a picture of an object on the other side will be seen very vivid in its centre, but less distinctly defined at its edges; on gradually withdrawing the screen, the marginal portion of the picture will become vivid as the centre loses its distinctness. Hence it is obvious, that no object can be seen with perfect distinctness in every part, through a convex lens, at the same moment, in consequence of this *spherical aberration*, as it is termed."

Here the author makes no distinction between the aberration of oblique pencils, and the aberration of the oblique rays of the central pencil. Besides, neither the one nor the other of these two aberrations appears by referring to the diagram indicated by the author.

In paragraph 655, we find this statement:

"With regard to the comparative rapidity of propagation of the two sets of undulations, into which light incident on a doubly refracting crystal is resolved, Huyghens has demonstrated that the difference between the squares of the rapidity is equal to unity divided by the square of the sine of the angle formed by the ray with the axis. In calcareous spar, the ordinary ray therefore moves with a greater velocity than the extraordinary one."

Now, but a slight acquaintance with mathematics is wanted to perceive that, when the internal ray is parallel to the axis, and the angle spoken of in the rule is equal to zero, unity divided by the square of the sine of this angle becomes infinite, and the difference between the velocities of the two rays infinite also; whereas, in fact, the two rays, in the case supposed, travel in the same direction and with the same velocity.

We have another instance of Dr. Bird's inaccurate analysis in paragraph 689. "On this account," he says, "no colors

were seen when the selenite was viewed without the analyzing plate or calc-spar, as *both* rays then reached the eye together, and produced a white image." The true reason why the colors in question are not seen without the analyzer is, that they are *produced* by the analyzer. In paragraph 27, we read: "The utmost elevation attained by the fluid in this arrangement is one half of that which would have taken place in tubes having their diameters equal to the distance between the plates; and being always inversely as this distance." We do not understand the meaning of this statement. The law is this: the elevation attained by the fluid in this arrangement at any distance from the angle of the plates is equal to one half of that which would have taken place in a tube whose diameter was equal to the interval between the plates at that point.

In paragraph 71, the student is thus instructed: "A cannon-ball, of three pounds' weight, possessing a velocity of three hundred feet in a second, will possess as much momentum, and strike any opposing substance with as much force, as one of thirty pounds moving at the rate of thirty feet per second, for $300 \times 3 = 30 \times 30$." The truth of this statement depends on the definition that is given of force, and we have no desire to stir the not yet extinguished embers of the protracted controversy on this subject. We will only say, that if the force of the ball is measured by the depth to which it can penetrate into a timber or into a column of men, the first ball has ten times the force of the second.

In paragraph 130, it is said, "when the pulleys are connected each to a separate string, the ends of the latter being attached, not to a beam, as in the last case, but to the resistance to be overcome, some mechanical loss is sustained, and equilibrium is obtained when $P : R : : 1 : (2^n - 1)$; 2^n being the power of two, whose index is the number of movable pulleys." This rule makes this arrangement only about one half as efficient as it really is.

Speaking of the magnetic needle, in paragraph 265, our author says: "The greatest variations ever observed were by the Chevalier de Langle, between Greenland and Labrador, amounting to 45° W., and by Captain Cook, in 60° S. latitude and 92° 35′ longitude, when the variation amounted to 43° 6′ east of the geographic meridian." Now, Captain

Ross, on the 31st of August, 1818, in latitude 74° N., and longitude 80½° W., observed a variation of 114°. Capt. J. C. Ross, in his cruise of 1840 – 1, observed a variation in the southern hemisphere of 114° 21′; and Lieut. Moore, in 1845, another amounting to 52° 17′.

In paragraph 592, Dr. Bird has omitted the value of the radius of the sphere, without which the statement has no meaning. He says, in paragraph 695, "An alteration in their size is also of constant occurrence, the rings being largest in the most refrangible, or violet, light, and smallest in red light." It is quite obvious that the very contrary is true. The author may have copied the mistake from his authorities, as we notice it frequently occurring in other books by some strange fatality. Herschell states the law incorrectly in the marginal reference to the subject, though it stands right in the body of the paragraph.

In paragraph 745, Dr. Bird makes the erroneous statement that the middle glass, sometimes introduced into compound microscopes, to increase the field of view, *increases* also the magnifying power. In paragraph 852, the relations of alum and rock-salt covered with soot to the unequally refrangible rays of heat are interchanged. The crude notions which Dr. Bird has of the optical doctrine of interference are manifested in the last sentence of paragraph 865.

We have made a collection of more than fifty other errors in the book, of every degree of importance. We have only space to refer the reader to paragraph 59, where there are two numerical errors; to the formulæ for falling bodies given in paragraph 91; to the laws of the pendulum as they are stated in paragraphs 105 and 108; to the effect of temperature on sound as mentioned in paragraph 226; to the principle of vibrating cords as represented in paragraph 237, C.; and to the algebraical formulæ which express the position of the foci of concave mirrors for diverging and converging rays, as these formulæ run in paragraphs 573 and 574. For accidental errors, either of the author or the press, and for improper expressions, (the result of too great haste in the preparation of the book,) we may refer to paragraphs 37, 47, 79, 84, 89, and many others.

After all the praise which we have been willing to bestow upon Bird's Elements of Natural Philosophy, it is clear that

it is overrun by errors of all kinds and dimensions; errors which have sprung from an ignorance of mechanical laws and mathematical analysis, or which have originated in a careless literary execution. To these errors of thought and expression, we must add errors of the press, which are very numerous. Errors of this class are more excusable, and would readily be pardoned in this case, were it not that nearly all of them, and some more serious blunders, have been repeated in three editions of the book. As very considerable additions have been made to the work in successive editions, it will be understood, of course, that we do not mean to assert that the mistakes which occur in the new matter were also made in previous editions which did not contain this matter.

We need not insist upon the importance of every kind of accuracy (even that of the typography) to the usefulness of a text-book designed for elementary instruction. The pupil leans upon his text-book till he has reached an advanced stage of proficiency. In scientific works, wherever they relate to matters of fact, all who do not observe and experiment for themselves must rely upon the text-book. Our own intuitions cannot decide upon the truth or falsehood of an asserted fact. Sometimes a wide range of scientific knowledge may put a single individual right, by the power it gives him of confronting one asserted fact with others with which it is inconsistent. This can only happen in cases where something like a law has been discovered, and the application is not always easy even then. Some persons may think, that the liability of a text-book to errors exercises the mind of the student, forces him to reflect, to compare passage with passage, and fact with fact; and so cultivates independence of thought. With mature minds, this may sometimes be the effect. But whenever the learner's knowledge of a subject is imperfect, he can succeed in persuading himself that the book is right even where it is wrong, by some false view to which he has contrived to accommodate his ideas. Sooner or later, he finds that the book was wrong, and that he did wrong in yielding up his convictions so readily to it. The reaction is likely to make him afterwards too prompt to suspect his guide, and to turn off every new difficulty with this suspicion, and thus give up the exertion which is needed to understand the subject. If, therefore, a book contain scores of mistakes of

all kinds, the pupil is disheartened, his vanity is wounded when he discovers that what he professed to understand was self-contradictory and absurd, and he may be tempted to abandon the study of the subject altogether.

In 1848, an American edition of Bird's Elements of Natural Philosophy was published at Philadelphia, which is a faithful transcript of the revised and enlarged third London edition. As this reprint is more likely to be generally consulted in this country than the English editions of the work, it would have been extremely fortunate for our own pupils, if the errors in the original, which we have pointed out, had been corrected in the American republication. But this is not the case, so far as we have examined, except in a single instance, where the number of the paragraph, which is printed incorrectly in the original work, is set right in the home edition. In every other example, errors of the most serious and the most trivial character, errors of analysis, errors of general statement, errors of style, errors of the press, errors of ignorance, and errors of careless haste, all are scrupulously copied and reproduced and perpetuated, to the detriment of the American student, as they had already been repeated and transmitted in the successive London editions. As they have survived four editions and eleven years of scrutiny, or want of scrutiny, perhaps they will go on undisturbed to poison the minds of all those who come to the book for guidance and instruction. An intelligent proof-reader in a well-regulated printing-office, without any special scientific or literary acquirements, would have been a guaranty against some of these errors.

For example, in paragraph 713, we read "Another process is that of M. Fresnal [Fresnel] by allowing a ray of plane polarized light, A B, to suffer two reflections from the internal surfaces of a parallelopipedon of crown-glass, where [whose] acute angles, K L, are inclined at 54° 30′ and when [whose] obtuse ones M N are equal consequently to 126." A little farther on we have *heat* instead of *light*. All the errors, corrected by us in brackets, are faithfully retained in the various editions of the work. The same is true in other places, where we have *elliptic* instead of *ellipse*, *Bibot* for *Biot*, *cubic* for *cube*, 2500 instead of 250; and in many passages, where a letter or word has been accidentally

changed or omitted at first, and the error is preserved inviolate.

We cannot refrain from saying a word in praise of the substantial paper, the clear typography, and the distinct woodcuts of the English editions, as contrasted with the poor paper, blurred illustrations, and dirty type of the American reprint. We have some regard for the eyes as well as the intellects of young students. We fear much that the infirmity of vision, which has increased so alarmingly among young and old, is aggravated, if it is not occasioned, by poring over the dim and crowded pages of some of our recently published text-books.

Whoever is in need of an elementary treatise on general physical science, and does not find his want satisfied by Bird's Elements of Natural Philosophy, must take refuge in the recent translations of one or two foreign works on physics. A translation of that portion of Despretz's Physics which relates to the mutual action of voltaic currents, was published in the second edition of Farrar's Electricity and Magnetism. An excellent treatise on the Elements of Physics (*Lehrbuch der Physik*) was published at Leipsic, in 1844, by C. F. Peschel, Principal of the Royal Military College at Dresden. A translation of the work into English, with notes, by E. West, appeared at London in 1845–6, in three volumes. A republication of this translation, made in proper style and corrected in a few particulars, would be a valuable text-book in American colleges. The translation of a foreign work, especially a German work, has this advantage, for those who speak the English language, over one written originally in their native tongue; it contains facts and describes instruments with which they are less familiar, either in their own language, or in French. Those parts of Peschel's work which discuss the subject of light, and of undulations in general, are full of merit. The book addresses the reader in popular, rather than in mathematical language; and if, on this account, it were less serviceable to one who desired to exhaust all the analytical intricacies of these subjects than such works as those of Lamé or Moigno, it is more freely accessible to the majority of those who frequent our halls of education. We have not had an opportunity of comparing the translation of Peschel with the original, and

therefore we dismiss it for the present with the remark, that the work itself is unsurpassed by any general treatise on physics that can be found in any language.

In 1844, Johann Müller, Professor of Physics and Technology in the University of Freiburg, in Breisgau, published a treatise under the following title: "*Pouillet's Lehrbuch der Physik und Meteorologie, für Deutsche Verhältnisse frei bearbeitet.*" Pouillet's *Eléments de Physique* is well known and highly valued in this country, as well as in France. It has passed through five editions, but has never been directly translated into English. A translation into our own language of this standard work would be a valuable addition to the scientific equipment of those who cannot study it in the original. The aim of Müller, in translating Pouillet's work into German, was not unlike that of Dr. Bird in the preparation of his Elements. It was, as we learn from the preface to the first edition, to meet the wants of general readers and young students, rather than to teach men of science; to furnish a manual of the most useful portions of physics to such as are engaged in kindred branches of science or of the arts which are cognate to them, — as chemists, physicians, pharmaceutists, technologists, political economists, &c. To accomplish this purpose, it was sometimes necessary to depart from a bare translation of the original French, to modify the old, and add much that was new. It was a principal object to discard, whenever it was possible, all mathematical formulæ, and to illustrate and explain, when it would not answer to reject them; so that every thing in the book might be intelligible to such as possessed only the rudiments of mathematics. The portions of the work which treat of molecular action and of acoustics have been least altered from the original, and those which relate to the mechanical laws have suffered the greatest change. The French writers on physics only touch upon mechanics. To make his work fit for the purpose he had in view, Müller treats more at length of the parallelogram of forces, of the lever and balance, of the free fall of bodies, of the laws of the pendulum, of specific gravity, the aerometer, and the expansion of gases by heat. The steam-engine is illustrated, and the laws of magnetism are enriched by an elementary statement of the researches of Gauss, — researches

which are not noticed at all in the original work. The chapters which discuss galvanism Müller claims as almost entirely his own; particularly the part which relates to the chemical influence of the circuit. Important changes have been introduced into the chapters which treat of electrical induction; also into those which develop the laws of optics, especially physical optics, as diffraction, polarization, and double refraction, in which the reader will find little in common with Pouillet. "I have sought here," says Müller, "to unfold in the most elementary and intuitive manner the elements of the wave theory." In regard to that part of Pouillet's treatise which relates to meteorology, Müller speaks thus: "Pouillet's meteorology, in the opinion of all intelligent men, corresponds so little to the latest point of view of German science, that a complete change was necessary in it. Such a change, for which I have made use of the resources and particularly the lectures on meteorology of Kämtz,* is in many respects a very difficult task. I can only hope that my attempt may not have utterly failed."

This work of Müller met with so welcome a reception that a second edition was demanded immediately after the completion of the first. Inferring from this great success that the plan of the work, in spite of many faults of detail, appeased an urgent want in the community to which it was addressed, Müller proposes to adhere to it still more rigidly in the second edition. Universal intelligibleness, he says, is the point at which I aim. To this end, the arrangement of the whole work is so altered that the subjects follow each other in a natural order, and the injudicious separation of the laws of heat into two parts is avoided. The laws of sound and light follow the mechanical parts. But it is not in arrangement only that the second edition is an improvement upon the first. All over the work, additions as well as improvements are found, and a radical change is made in the portions given to acoustics. In consideration of all these alterations, begun in the first edition, and continued and multiplied in the second, so as to leave in the latter little which belongs to the French work, Müller felt himself justified in altering the title of the new edition so as to read, "*Lehrbuch der Physik und Me-*

* Erroneously spelt Kaemptz in No. 148 of this Review.

teorologie, von Dr. J. Müller, &c. Als zweite umgearbeitete und vermehrte Auflage der Bearbeitung von Pouillet's Lehrbuch der Physik." In 1847, the third and last edition of Müller's book was published. The most important discovery, in the opinion of the author, which had intervened between the publication of this and the previous edition, was Faraday's discovery of diamagnetism, and of the change in the plane of polarization which is effected by magnetic and voltaic currents in a ray of polarized light which is passing through a diamagnetic substance. This pregnant experiment of Faraday establishes, as Müller thinks, an important relation between light and electricity. In our opinion, the relation is not different in character from that which Brewster and Fresnel had long ago found to exist between light on the one hand and mechanical and calorific disturbance of the molecular arrangement on the other. In this last edition, the laws of heat have been enriched by the fruits of Regnault's labors, and the laws of light by the prismatic analysis of the colors of interference. In other respects, the third edition is the same as the second. For the benefit of those who had purchased the earlier editions, Müller has published his additions and improvements in two supplements, which are sold separately from the whole work.

The peculiarities to which we have adverted in Müller's book mark it as one exceedingly well adapted to general students. What they require is a sweeping view of the whole subject of physics, such as suits the demands made upon every man of liberal education, and can be compassed without extensive mathematical attainments. On this account, we are persuaded that a translation of Müller's work by any competent person, who had the heart to undertake it, would be at once installed as a text-book in our colleges, and would meet the approbation of teachers and professors of physical science generally. Müller has also published, under the title of "*Grundriss der Physik und Meteorologie*," two editions of a still more elementary work on physics than the one we have just noticed. This new work is mainly identical with the *Lehrbuch*, after the latter has been reduced to about half the number of pages and illustrations contained in its original form. Wherever the course of physical instruction is very limited as to time and completeness, this miniature copy of

Müller's Physics will be preferred to the larger work. This abridgment, in which the reader will recognize very little that belongs to Pouillet's treatise, (which was the stock on which these various publications were engrafted,) was translated and printed in English in 1847, under the title of "Principles of Physics and Meteorology." The translator, whose initials correspond with the name of one of the translators of Humboldt's Cosmos, speaks thus of his task: "Of the manner in which the translator has executed his task, it behooves him to say nothing; he has attempted nothing more than a plain and nearly literal version of the original." This translation was republished at Philadelphia in 1848, and we give the following extract from the publishers' preface.

"In preparing it, the American publishers have availed themselves of the services of a competent editor, who has made various alterations and additions. . . . . Articles have also been added on the electro-magnetic telegraph, electrotype, steam-engine, &c., with the necessary illustrations, while various errors of importance, which had escaped the London editor, have been corrected. The publishers hope that the care exercised in the revision of the work, and the accuracy of the text, which it has been their aim to secure, will be deemed of sufficient importance to enhance the value of a work which has already received deservedly high commendation."

We have had an opportunity of examining both editions of this translation, and have made a laborious comparison of the American edition with the original German. We selected the American edition for this purpose, as being the one in which our own teachers and students were most interested. We regret to say, as we must, after a close examination, that the translation is neither an intelligent nor a careful one, that it is often inelegant and awkward, that it contains some extraordinary words, and frequently perverts the sense of the original. There are numerous other mistakes, which are the fault either of the translator or the printer; if they are chargeable to the latter, the typographical accuracy of the book is of a low order. We have made a collection of one hundred and fifty mistakes, of every description and degree, in the American edition, and, with only two or three exceptions, they have all been copied from the English edition. The errors in the translation are such as no one, acquainted with the

subject of the book, could ever have made; and the accidental errors, as we are willing to regard them, in the English edition of the translation, are mostly such as an American editor, with a little reflection and a very little science, might have detected and corrected. The American publishers assure the reader that various errors of importance, which had escaped the London editor, have been corrected. We can assure the reader that one hundred and fifty errors, none wholly unimportant, and many of considerable magnitude, have escaped the scrutiny of the competent American editor, and disfigure the reprint as they had already disfigured the London edition, of which the reprint is little better than a blind copy. We are aware that several wholesale additions and alterations have been made; but no thought has been exercised in the details of the work, and the attempt of the editor to reduce the centigrade thermometrical degrees, which were retained by the London editor, to Fahrenheit's scale, has been carried out so clumsily and imperfectly as to be quite untrustworthy.

We propose to give a few specimens of the various errors to which we have referred, as illustrative of the genus to which they belong. We will first notice some of the errors of translation; and in all our references we shall use the pages of the American edition. We must add that we have compared the translation, not with the first German edition from which it was made, but with the second German edition. It is possible that some of the errors to which we shall allude are chargeable on the original work, and have been corrected in the second edition. We do not believe, however, from the character of the errors, that the translator will be able frequently to offer this plea or defence.

On page 111, *Oberflache* is translated *upper surface*, though the word means *surface* simply, and the context shows that in this passage it was really the *under surface* which was spoken of by the author.

On page 176, *Die wir gleich näher betrachten werden* (which we shall consider presently) is rendered, *which we proceed to consider more attentively*. It is surprising the translator was not struck by the fact that the author, after so fair a promise, did *not* proceed to consider the subject.

On page 197, we read, "The laws of the passage of gases

through openings in thin walls, and through conducting pipes, are analagous to those bodies of liquid with which we have become acquainted;" *sind denjenigen ganz entsprechend, welche wir schon bei tropfbar flüssigen körpern kennen gelernt haben.*

On page 388, *kugel* is translated *body*, instead of *sphere*, although the whole point of the sentence depends on this word. On the next page, *dünner* is translated so as to refer to *density* instead of *bulk;* although this translation destroys the meaning of the sentence. Moreover, *dichter*, which means *more dense*, and is so rendered by the translator, occurs twice in the paragraph in which the mistake is made.

On page 411, we are thus directed: "and to effect this, it is only necessary to hold one pole in one hand, (*in der hand*, in the hand,) while we touch with the other *hand* (*mit der andern*, with the other pole) the plate or the ball of the electromotor."

On the bottom of page 528, we begin to read, "the temperature of the vessel falls, however, simultaneously, as all the heat which had been combined is given off at once by the energetic formation of steam." Then it is surprising that the temperature should fall, if so much heat is given off. The original is, *Gleichzeitig aber sinkt die Temperatur des Gefässes, weil er alle die Wärme liefern muss, welche auf einmal bei der heftigen Dampfbildung gebunden wird;* that is — "but at the same time the temperature of the vessel falls, because it must supply all the heat which is made latent at once in the energetic formation of the steam."

On page 600, we read, "they (the rain-drops) increase in size, however, as they fall, owing to the vapor of the strata of air becoming condensed, on which account they fall." *Sie werden aber während des Fallens grösser, weil sie wegenihrer geringeren Temperatur die Wasserdämpfe der Luftschichten verdichten, durch welche sie herabfallen.* "But they become larger as they descend, because, on account of their lower temperature, they condense the water-vapor of the strata of air through which they fall." In the next paragraph, *jederzeit* (at any time) is translated *every time*, so as to make nonsense.

On page 609, *namentlich, wenn die Tropfen in einer nur etwas bedeutenden Entfernung vom Auge sich befinden*, is

rendered, "especially when the drops occur at *only a slight*, (at a considerable,) distance from the eye." On page 238, *bei den Durtonarten*, (in the major key,) is rendered "*through the gamuts*;" and below, *bei den Molltonarten*, (in the minor key,) is translated, "*in the soft-toned gamuts.*" On page 392, *die eine Belegung* is translated, "*the one coated surface*;" and not, as it should be, "one of the coated surfaces." On page 533, we read, "The cold water, which enters the condensing tube, flows forth from the other end heated." It should be, "The water which enters the lower end of the condensing tube cold, flows forth from the upper end heated." *Das Kühlwasser, welches am untern Ende des Kühlrohrs kalt zufliesst, fliesst am obern Ende des Kühlrohrs erwärmt wieder ab.*

On page 180, *wenn wir in diesen Werth von c' den eben abgeleiteten Werth von g' setzen*, (if we introduce into this value of c' the value of g' just obtained,) is translated, "if we add the value of g' to this value of c'." On page 239, *Temperatur*, which the context shows must mean, in this case, *musical temperament*, is translated, *temperature*. On page 354, *Folgepunkte*, which in magnets means *consecutive points*, is translated *successive stoppages*. On page 398, *Blitzröhren*, which in electricity means *lightning tubes*, is translated *lightning conductors*. On page 556, *Ekliptic*, which means *ecliptic* in English, is translated *elliptic*. On the next page, *Gestirne*, which means *stars*, is translated *planets*. On page 570, and throughout, *isotheren*, which means *isotheral*, is confounded with *isothermische*, which occurs a few pages before, and is rendered by the same word, *isothermal*; that is, the lines of equal *summer* heat are confounded with the lines of equal temperature. On page 581, *indem* (because) is translated *although*; and on page 594, *oder* (or) is translated *otherwise*; and the sense is ruined in both cases.

Let us see now some of the more trivial errors, which, whether originally caused by the carelessness of the translator or the printer, are copied by the American editor. A competent editor would have detected and corrected them on the most hasty perusal. At the top of page 573, we read, "These differences are owing to the more easy absorption and radiation of heat, which becomes heated and again cooled more rapidly than the sea, which, *by the continent*, is every-

where of a uniform nature." The words in italics are out of place, and should follow the word *heat.*

On page 39, we have *by*, where we should have *and.* On page 55, *mit Worten* (in words) reads *inwards.* On page 61, we have *quantity* instead of *gravity.* On page 109, we have *minor* for *inner;* on page 132, we have *friction* for *piston;* on page 137, *close* for *strong;* on page 150, *on equal terms*, for *in equal times* (in gleichen Zeiten); on page 153, *m* for *n*; on page 170, *rebound* for *does not rebound;* on page 173, *check* for *clock;* on page 234, *end* and *middle* change places; on page 241, we have *sure note*, instead of *pure note;* on page 262, *focus* for *centre;* on page 268, *vertical* for *imaginary;* on page 430, *polatine* for *positive;* on page 481, *Mobile* for *Nobili*; on page 507, *pass* for *press* (drücken); on page 545, *transparent* for *nontransparent;* on page 578, *thermometer* for *barometer*, twice; on page 581, *land wind* for *sea wind;* on page 596, *they* for *it;* on page 601, *decreases* for *increases;* on page 607, *transitive state* for *transition state.* On pages 161, 189, 225, 236, 544, 588, &c., words are omitted so as to obscure the sense, though the omissions can be readily detected if the passages are read with attention.

We have alluded to the occasional want of elegance and literary exactness in the translation. This defect is of less importance in a scientific work than a misstatement of facts and laws; therefore we shall illustrate it with great brevity. On page 121, we read, "In order that two different columns of fluid should be equipoised, it is *necessary* that their height *must be* inversely as their densities." Again, on page 244, "Such a system forms a whole, which, if a point be made to vibrate, will be like a single solid body *divided* into separate vibrating parts, divided by nodes of oscillation." On page 96, *oben* is translated *superiorly.* We also encounter such unusual words as *doubtlessly* and *closure.* Perhaps the latter word could not be avoided without changing the form of the sentence.

The decimal system of weights and measures and the centigrade thermometer are used exclusively by Müller. We should rejoice to see the metrical system (with the exception of the centigrade thermometer, which is not a natural part of the system) introduced into English and American science,

that the metre might go round the earth in use, as it does by its multiplied extension. It is time that a delivery should come to all men from the uncertainty, complexity, and instability of *long measure* and *short measure*, of *Troy weight*, *avoirdupois weight*, and *apothecaries' weight*; of *dry measure*, *beer measure*, and *wine measure*. In the reign of Queen Elizabeth, the English standard of length was an old poker, which, being once broken, was joined together carelessly, and still continued in use. Certainly some improvement has taken place upon this state of things; but the weights and measures used in Great Britain and this country, in simplicity, symmetry, and consistency, are not to be compared with those of the decimal system. The metre has but one value over the whole world; the foot means a different thing in every different petty principality of Europe, and is almost as various as if each individual should use his own foot as the standard of length. We think that the English translator has acted wisely in retaining the metrical standards used by Müller, giving only a short table of the values of the principal ones in English measures, a table which the American editor has materially enlarged. We think, however, that it would have been better if the centigrade degrees had been reduced to Fahrenheit's scale, as the latter possesses advantages over all others, though itself confessedly imperfect. In one instance, the translator has forgot himself and reduced the temperature to Fahrenheit's scale.

"For a temperature of 68°, [20° in the original,] for instance, the maximum of the force of tension of steam is 17.3 millimetres, and the corresponding density of the steam, 0.00001718; in a vacuum of one cubic metre, at a temperature of at most 68° [20° in the original,] 17.18 grms. of water may be contained in the form of vapor."

In the first place, there is a grave error in the translation, which a thoughtful reader would have paused to correct. The latter part of it should be, "in a vacuum of one cubic metre, at a temperature of 68°, 17.18 grms. of water at most may be contained in the form of vapor." Our American editor allows this mistake to pass; he also overlooks the fact that the temperature in this passage was expressed in Fahrenheit's scale, (a fact, which the table on page 504, enlarged somewhat by himself, would have taught him, if he had consulted it); and so, to make matters sure, he reduces the

Fahrenheit degrees again to Fahrenheit; makes another original blunder by writing, in the place where the temperature is last mentioned, 78° for 68°, and reducing it as such, when it should not have been reduced at all; so that the whole passage reads thus:

"For a temperature of 68° (154° F.) for instance, the maximum of the force of tension of steam is 17.3 millimetres, (.633 in.) and the corresponding density of the steam, 0.00001718; in a vacuum of one cubic metre (27.0.3 cubic feet,) therefore, at a temperature of at most 78° (172° F.) 17.18 grms. (264.93 grs.) of water may be contained in the form of vapor." pp. 591–2.

The explanation of the American editor's original blunder is not to his credit. On the same page of the English edition, in two other passages, 78° is written erroneously for 68°. The American editor copies both these mistakes, makes two other mistakes in reducing each number to Fahrenheit, and then volunteers an additional change of 78° for 68°, where it stands right in the English edition. By such a tissue of blunders, the confiding student is misled, and the time of even an accomplished scientific man is wasted in discovering and avoiding the error.

A paragraph on page 537 contains three mistranslations, which the American editor has copied, and to which he has added one error of omission and seven of commission. Some of the positive errors were occasioned by reducing the centigrade degrees to Fahrenheit's, and not making any account of the mistranslations. Others are the result of another sort of carelessness, — that is, of reducing part of the paragraph to Fahrenheit's scale, and not other parts numerically associated with the former.

"If we assume that a platinum ball weighing 200 grms. (3088 grs.) warmed to 212°, has been immersed in a mass of water of 105 grms. (1621 grs.) at 59°, and has raised its temperature, by its own cooling, to 68°, that is, has heated the water 9°, it is clear, that the 200 grms. (3088 grs.) of platinum must be cooled down *to* 176°, in order to heat 105 grms. (1621 grs.) of water 9°. The same amount of heat that has been yielded by the platinum ball would, therefore, also have sufficed to raise the temperature of 525 grms. (8108 grs.) of water (1.8°.) If the platinum ball had only weighed one grm. (15.444 grs.) the amount of heat given off by it, *at* a depression of temperature of 176°, would be able to warm only $\frac{525}{200}$, ($\frac{8108}{3088}$ grs.) or 2.625 grms.

(grs.) of water, (1.8°,) or 1 grm. (15.444 grs.) of water 2.625°. Hence, it follows, that the same amount of heat that raises the temperature of 1 grm. (15.444. grs.) of platinum 176°, can only raise an equal mass of water 2.625°; platinum thus requires only $\frac{2.625}{80}$, that is, 0.0328 times less heat that an equal *quantity* of water, to experience an equal variation of temperature; the specific heat of platinum is consequently, 0.0328."

This statement, so absurdly and variously inconsistent with itself, should be thus: —

"If we assume that a platinum ball weighing 200 grms. (3088 grs.) warmed to 212°, has been immersed in a mass of water of 105 grms. (1621 grs.) at 59°, and has raised its temperature, by its own cooling, to 68°, that is, has heated the water 9°, it is clear that the 200 grms. (3088 grs.) of platinum must be cooled down by (*um*) 144°, in order to heat 105 grms. (1621 grs.) of water 9°. The same amount of heat that has been yielded by the platinum ball would, therefore, also have sufficed to raise the temperature of 525 grms. (8108 grs.) of water 1.8°. If the platinum ball had only weighed 1 grm. (15.444 grs.) the amount of heat given off by it, by (*bei*) a depression of temperature of 144°, would be able to warm only $\frac{525}{200}$ ($\frac{8108}{3088}$) or 2.625 grms. (40.54 grs.) of water 1.8°, or 1 grm. (15.444 grs.) of water 4.725°. Hence it follows, that the same amount of heat that raises the temperature of 1 grm. (15.444. grs.) of platinum 144°, can only raise an equal mass of water 4.725°; platinum thus requires only $\frac{4.725}{144}$, that is, 0.0328 times less heat than an equal mass (*Wassermasse*) of water, to experience an equal variation of temperature;" &c.

These are not the only dilemmas into which the American editor has fallen in his ambition to improve upon the English edition. On page 496, —10° of the centigrade scale is put down as —18° of Fahrenheit, instead of +14°. In the second paragraph, which treats of latent heat, (also on page 496,) the degrees are reduced to Fahrenheit; in paragraphs fourth, fifth, and sixth, they are not; and yet they are intimately related. The subject closes up with a mistranslation. "Pulverized Glauber's salts, over which muriatic acid has been poured, give a fall of temperature of (from) +50 to —1.4 F." On page 532 we read, —

"We have already stated, that, for the unit of heat, that quantity of heat is assumed which is requisite to raise the tempe rature of 1 lb. of water 1°; to raise the temperature of 5½ lbs. of water to the same amount, 5.5 are therefore necessary, and

550 such units of heat to raise the temperature of this mass 212°."

Here the American editor was in straits. If he did not reduce the degrees of the thermometer to Fahrenheit, there would be a want of sequence between this paragraph and the preceding; if he did, there was a glaring inconsistency between this paragraph and the statement on page 496, to which he refers in it. He concludes to reduce, reduces incorrectly, and forgets that he has reduced at all. The last portion of the passage, reduced to Fahrenheit, should stand thus: "to raise the temperature of 5½ lbs. of water to the same amount, 5.5 are therefore necessary, and 990 such units of heat to raise the temperature of this mass 180°."

After this, we can hardly be surprised that Müller's remarks on the pressure and motions and clearness of the air in Europe, in which he makes use of the expressions, "in our districts," and "in our latitudes," should be allowed to stand unmodified, as if they were just as applicable to the eastern shores of this continent as to the western shores of Europe. And here again, page 580, the meaning of the author is weakened by a bad translation. "This is, however, only, as we have before remarked, an average rule; for the sky is often cloudy with a northeast wind, and clear with one coming from the southwest; the statement is in so far true as that the barometer stands high or low according to which of these two winds prevails, the remark in the latter case being nearly true on the average." *Sie ist jedoch in derselben Ausdehnung wahr wie die, dass bei Nordostwind das Barometer hoch, bei Südwestwind dagegen tief steht: dies ist auch nicht immer, sondern nur im Durchschnitte wahr.* "It is true to the same extent as this, that the barometer stands high in a northeast wind, and, on the contrary, low in a southwest wind; but this also is not always true, but only on the average."

The English edition of the translation of Müller's work appears comely in its white dress and clear typographical expression; the beautiful and abundant wood-cuts, (of which there are more than five hundred,) by which it is illustrated are an ornament to it. The American edition, also, is refreshing to the eye to behold in these days of dusky paper and small type. Both editions of the translation have closely imitated

the style of the German illustrations, which are very excellent, especially in the parts which refer to the wave theory of light. The white lines upon the dark ground, suggesting to the student his chalk and blackboard, are a gratifying novelty in the garniture of a text-book. The eye is also captivated by two colored plates, on the colors of diffraction and polarization, which are only surpassed by the exquisite plates on the same subjects in Pouillet's Physics. It is certainly to be regretted, that the two editions of the translation which we are considering, though so pleasant to the sight, should turn to bitterness when tasted. It is to be regretted, that the publishers at home and abroad could not afford to pay as liberally for the literary, scientific, and typographical accuracy of their publication, as for the outside show with which it should parade before the public. We have no doubt that the translator, badly as the work is done, fulfilled his contract with the publishers, by expending all the time and labor upon it for which he was paid. If the English publishers did not reward the author for his work, generosity would dictate that they should not injure his reputation by a false translation of his ideas. If the American publishers saved the expense of the translation, the translator might fairly claim, that, if his errors were not corrected, they should not, at least, be aggravated by the American editor; and the public might expect to enjoy the luxury of being mistaught without paying an exorbitant price for it.

A necessity is laid upon men, which will compel them to use both of the works at which we have taken exceptions, (Bird's Elements of Natural Philosophy, and the translation of Müller's Principles of Physics and Meteorology,) until better books are written, or good books are better translated. How low must be the standard of scientific scholarship in Great Britain and in this country, if those who use these text-books of science are satisfied, or, though not satisfied, if they are unable to dispense with them! How long shall it be true, that the best English works on general physics, as developed at the present day, are translations from foreign treatises; and that these translations are so inaccurate that they cannot with safety be put into the hands of the pupil? How long shall it be true, that books which profess to teach the exact sciences are overrun with blunders which would disfranchise any literary production?

ART. VI. — *Propositions concerning Protection and Free Trade.* By WILLARD PHILLIPS. Boston: Little & Brown. 1850. 12mo. pp. 233.

QUESTIONS of science, especially in the moral sciences, when their determination seems likely to affect the material interests of rival classes in the state, are not likely to be dispassionately weighed, or fairly answered. In vain are the eager disputants reminded of the fundamental distinction between a science and an art, — that the former relates exclusively to the formal evolution, whether by inductive or deductive logic, of abstract principles, while the latter alone is concerned with the application of these principles to the practical business of life. The application of the principle seems easy and obvious; it is taken for granted that it can be applied but in one way, and that without limitations or exceptions. The consequences of such application are found to be offensive, or perhaps injurious; and those who are harmed by it are then tempted to quarrel, not merely with the faulty reduction of the theory to practice, but with the theory itself, — with the fundamental principle, it may be, of a well approved and almost universally recognized science. Thus, mutual jealousy and dislike are needlessly fostered between speculative and practical men, as they are called; the former are led to despise the short-sightedness of those who rely only upon the familiar lessons of daily experience, while the latter regard with contemptuous pity the abstract theorems concocted by a dreamy professor in his closet. Both are right, when they confine themselves within the proper limits of their respective vocations; both are wrong, when, consciously or unconsciously, they transcend those limits. The lessons of experience are adequate to modify the rules of art, but they cannot shake the principles of science; for science is but a larger generalization of experience, or else a deduction from those primary principles on which the validity of all experience depends. It is a safer course, to say the least, to call in question the applicability of the principle to the particular case, than boldly to deny the principle itself in all its generality, or to affirm that the science, of which it forms a part, has no

secure foundation. It may turn out, on farther examination, that the supposed exception tends only to confirm the rule.

These remarks are particularly applicable when we come to treat of the science of political economy and the art of legislation, with a view to the promotion of great national interests and the growth of national opulence. They are particularly applicable here in America, where our situation, in reference to the main elements of national prosperity, is wholly peculiar. We are separated by a wide waste of ocean from all the other great commercial and manufacturing nations of the earth. Our population, though it has become absolutely large, is small when compared with the vast extent of territory that it occupies. We have the elements of agricultural, manufacturing, and commercial wealth in great abundance; but many of them are yet undeveloped, and the question, in what order they are to be brought out, whether they are to grow simultaneously or successively, is a serious and difficult one. Besides, the science of political economy to us is one of foreign origin, as it has been but little cultivated by native thinkers. Principles which, if not immediately deduced from the experience of England and France, have been chiefly considered in their application to the people of those two countries, need to be defined and limited anew before they are brought across the broad Atlantic. It behooves us to study European systems of political economy with diligence and caution before we make much use of them under circumstances so dissimilar from those which first suggested them. But it also behooves us not to reject the whole science in a pet, because we have discovered that some of its dogmas are not suited to our position, and do not meet our wants.

The author of these Propositions concerning Protection and Free Trade is an able and earnest advocate of a protective policy, as best suited to the condition and interests of the United States. In this respect, we very heartily agree with him; we accept many of his arguments, and think that he has very clearly exposed the fallacies and unsound reasoning of those who have maintained that the principles of free trade ought to govern the present course of American legislation. But we do not believe that the science of political economy is responsible for their blunders, their imperfect observation, and their want of skill in reducing scientific principles to practice

under peculiar circumstances. Certainly, it is not politic to maintain, that the American protectionists must begin by attempting to overturn the whole edifice erected by Adam Smith, Ricardo, Senior, McCulloch, and Mill, and proving that these writers are wholly undeserving of credit. Whatever errors Adam Smith may have committed, he must be regarded as the founder of a science, which, for the last half century, in every civilized country on earth, has more directly affected and controlled the material interests and daily pursuits of men than any discovery or pure speculation that has been made since the revival of letters; and which is even now exerting an influence that can hardly be measured upon the legislation and economical polity of all nations that are not sunk in barbarism. This assertion may seem to be unwarrantably sweeping; but it is supported by the high authority of Sir James Mackintosh, who, when speaking of Adam Smith's great work on the Wealth of Nations, remarked that it is "perhaps the only book which produced an immediate, general, and irrevocable change in some of the most important parts of the legislation of all civilized states." In a few years after its publication, he went on to say, "it began to alter laws and treaties, and has made its way throughout the convulsions of revolution and conquest, to a due ascendant over the minds of men, with far less than the average of those obstructions of prejudice and clamor which ordinarily choke the channels through which truth flows into practice."

Twenty years have elapsed since Mackintosh pronounced this opinion; and during these twenty years, the influence of Adam Smith's science of political economy has been even more conspicuous and direct than it was during the period of which he spoke. It has shaped the polity of nations; its principles are embodied on almost every page of commercial law; it has guided the most important applications of national industry; it has done more than all other causes united to put a stop to the practice of international war. Though its doctrines have been somewhat modified, and large additions have been made to it, it is still, in the main, what we have called it, Adam Smith's science. His successors have built mainly upon the foundations which he laid, and the structure has risen in general conformity with the plan which he sketched out. Among all the moral sciences, there is no other which

bears the name of its founder so distinctly engraven upon its front, or which retains so large a proportion of the doctrines that he first promulgated.

It is a misfortune, then, for any proposed measure or act of public policy, that it can be supported only in opposition to the doctrines of Adam Smith, and by discrediting his authority and that of the science which he established. We certainly do not believe that such a course is necessary before we can offer a satisfactory defence of what is properly called the American policy, of offering adequate protection to domestic manufactures by duties which shall restrict the importation of foreign goods. Yet Mr. Phillips has adopted this course, and, as it seems to us, with needless asperity of language. He has thereby, we think, only weakened the cause which he is endeavoring to support, and created a prejudice which lessens the effect of his own arguments. He has done so much, by his previous writings, to illustrate and defend the principles of economical science, that we cannot now suspect him of a wish to overturn the whole edifice for the mere purpose of establishing his favorite policy upon its ruins. Yet his language, if strictly construed, seems more than once to indicate such an intention. It is but fair, however, to quote from the Preface to the work now before us the explanation which he offers of the results of his studies, and the consequent effect upon his feelings.

"I should be happy to believe that there is little at stake, and that the doctrines of free trade do not tend directly to the distress, decay, and political subordination and degradation of this country, and the too great entanglement of its industry and interests with those of other nations. But it has not happened to me in thus devoting my attention more particularly to these inquiries, as it did some thirty years ago. Being then imbued with that economical creed which is taught in our public seminaries, I had occasion to attempt its vindication, against the aggressions then supposed to be made on commerce by the useful arts, through protective legislation; and I had the good fortune or misfortune, on investigating the subject anew, to convert myself to the opinions I had undertaken to combat. I came out with the thorough conviction that the science, which seemed so luminous to those at the feet of the Gamaliels, consisted very much of groundless postulates and sophistry. I could not divest myself wholly of a feeling of resentment at having been imposed upon. It is possible that this senti-

ment may sometimes tinge my phraseology. If it does so, I will rely upon your accepting the cause as my apology, if you are not on the side of free trade; if you are upon that side, you will take it in good part, without any apology; for no persons are less sparing than the advocates of that doctrine, in applying uncomplimentary epithets to such as cannot say 'Shibboleth.'" pp. 4, 5.

Reactions sometimes go too far. A change of opinion, if radical and sweeping, is likely to be defended with some degree of personal feeling intermingled with the desire to serve the interests of science and the cause of truth. In no other way can we account for the warmth of feeling and severity of expression which characterize such passages as the following.

"I more especially and hopefully address these propositions, not only to those who have not examined the subject, but also to persons* who, having wandered into the mysticisms of free trade, in their incipient cogitations upon social phenomena and social destiny, have too easily acquiesced in *the enormous sophisms and inconsistencies of Adam Smith and his echoes*, and are free from pride of opinion, *esprit du corps*, or other bias, to hinder them from revising their opinions candidly." pp. 110, 111.

"If you doubt whether I am giving a genuine specimen of the logical deductions of the economical science of Adam Smith, and Mr. Walker, and the agents of foreign manufacturers in our seaports, it is because you have not read the secretary's report, and the treatises of free-trade economists, and the profound articles on this subject in the free-trade periodicals; and I accordingly have the honor of initiating you into that transcendent science." p. 180.

"This signal commonplace of free trade [that capital withdrawn from one employment will be turned to account in some other] is *characterized no less by cool contumely to misfortune, than outrage to the common sense of mankind.* You meet with it in all the free-trade essays, great and small, from Adam Smith downward." p. 107.

"I speak of the theory [of free trade] as being, at the outset, a dreamy hallucination, made up of fallacious, sophistical assumptions, the reproduction and reiteration of which, at this time of day, after so many unanswered and unanswerable expositions and experimental demonstrations of its utterly false and shammy character, call to mind the profound Mr. Jenkinson's learned discourse on Sanconiathon, Berosius, and cosmogony, to which one

* Pars quorum fui.

might fairly give the reply of the Rev. Mr. Primrose, 'I beg pardon, sir, for interrupting so much learning, but I think I have heard all this before;' and request the teacher of these mysteries of his 'science,' to spare himself and us the repetition of those general, abstract, indefinite, mystical, transcendental theorems, and set about giving us some reason, practical or theoretical, for assenting to some one, at least, of those eleven fundamental propositions, to all of which he presumes our assent." pp. 108, 109.

"By my troth, these are very bitter words;" and we do not think they aid the argument much. The writer's indignation so far blinds his vision that he sometimes, quite unconsciously, misrepresents the very doctrine which he so vehemently censures. If he had read a little further, or more carefully, he would have found Adam Smith warmly eulogizing the very measure which he is here sharply scolded for opposing. For example: —

"The Irish are suffering the evils of deficiency of employment, and of the consequent partial distribution of food and other products, so that many can obtain only enough to protract the agonies of death. 'Let alone,' say the professors of the free-trade school, 'the evil remedies itself;' that is, the people die.

"In Cromwell's time, the Dutch had got the start of the English in the carrying trade, and carried for them as well as for others. '*Let alone*,' *say Adam Smith, etc.*, down to Mr. Treasurer Walker, who would have said, 'the evil will cure itself.' But Cromwell and his Rump Parliament thought it safer to cure it themselves, and so passed the Navigation Act; by the operation of which they drove the Dutch out of, not only the carrying for themselves, but also that for other nations." p. 48.

We had supposed even the most careless reader of the Wealth of Nations must remember that, from his general argument against restraints upon importation, Smith excepts "two cases, in which it will be generally advantageous to lay some burden upon foreign, for the encouragement of domestic industry."

"The first is, when some particular sort of industry is necessary for the defence of the country. The defence of Great Britain, for example, depends very much upon the number of its sailors and shipping. *The act of navigation, therefore, very properly endeavors to give the sailors and shipping of Great Britain the monopoly of the trade of their own country,* in some cases by

absolute prohibitions, and in others by heavy burdens upon the shipping of foreign countries."

After giving a general account of the provisions of the act, and the reason, (jealousy of the Dutch, who were then the great carriers of Europe,) why it was passed, Adam Smith goes on to say: —

"When the act of navigation was made, though England and Holland were not actually at war, the most violent animosity existed between the two nations. It had begun during the government of the Long Parliament, which first framed this act, and it broke out soon after in the Dutch wars during that of the Protector and of Charles II. It is not impossible, therefore, that some of the regulations of this famous act may have proceeded from national animosity. *They are as wise, however, as if they had all been dictated by the most deliberate wisdom.* National animosity at that particular time aimed at the very same object which the most deliberate wisdom would have recommended, — the diminution of the naval power of Holland, the only power which could endanger the security of England."

And he subsequently observes, "As defence is of much more importance than opulence, *the act of navigation is, perhaps, the wisest of all the commercial regulations of England.*" *

It is evident, then, however obnoxious Adam Smith may be to the censure of Mr. Phillips in other respects, that in regard to the policy of the navigation act, the two entertain precisely the same opinions. In this particular, Mr. Phillips is only buffeting the comrade who is helping him to trim the sails of the ship, having the same harbor in view. And we may remark in passing, that "the second case," in which Adam Smith admits that "it will generally be advantageous to lay some burden upon foreign for the encouragement of domestic industry," is one which, when properly considered, and carried out to the full extent of the principle involved in it, will cover a great part of the ground for which our author here manfully contends, fancying all the while that he is fighting against the great founder of political economy as a science, and destroying the *prestige* which, for nearly a century, has surrounded his name. Such a battle in the dark, when the foot-lights are again turned towards the stage, is apt only to excite the merriment of the spectators.

---

* *Wealth of Nations*, McCulloch's edition. 1846. pp. 203, 204.

Among all the peculiar doctrines maintained by Adam Smith and his disciples, that which most kindles the ire of our author is the *laissez-faire*, or "let-alone" principle; and construing it, as he seems to do, into a censure of "whatever laws you pass, or neglect to pass, either economical, civil, or criminal," and thereby into a deprecation of all activity on the part of the government, and almost into a denial of the blessings of any social union among men, we do not wonder at the fierceness of his indignation. He may well say, —

"It is the pickpocket, the cheat, the impostor, the man of false pretences, who says universally, *Laissez-nous faire*, Leave us alone. The millions of the industrious invoke the laws and all the social influences to help them, or rather to enable them to help each other." p. 8.

"The *let-us-alone* doctrine is for the marauder, the bee that plunders another's hive, not for the one that collects its stores in the fields." p. 11.

"A nation ought to act as a sensible individual would, if he were a nation. This shallow truism is all the truth that can be extracted from this grand fundamental proposition of Adam Smith. I think, then, we may safely say that the let-alone doctrine is based upon a miserable fallacy." p. 24.

Apart from any measure of respect which even the uninitiated in economical science may believe to be due to the name of Adam Smith as a thinker and a moralist, we think that few intelligent students of his work will admit that the let-alone principle, as set forth and advocated by him, amounts either to the monstrous disorganizing and anarchical maxim, or to the shallow truism, into which it is here resolved. We believe, and shall endeavor at some length to show, that it contains a pregnant and highly valuable truth, most applicable to the circumstances and exigencies of our own times, and one which is perfectly consistent with what we consider to be both the English and American doctrine, that infant manufactures, in any country, ought to be nursed and protected against foreign competition, until they are able to compete with those of other lands upon equal terms. It is most unfortunate that our author's lucid, cogent, and comprehensive argument in behalf of this doctrine should be needlessly deformed and weakened by these idle thrusts against the authority of political economy as a science, and against

the reputation of its illustrious founder. We would gladly sit at his feet, or follow in his track, while he draws forth, in a style of almost unrivalled vigor and terseness, the numerous considerations in favor of the universal adoption of this doctrine here in America. But this may not be till we have attempted, however imperfectly, to vindicate American protectionists from the reproach of flying in the face of all economical science, and of wholly repudiating the authority of some of the master thinkers both of the last century and of our own times. We must therefore crave the indulgence of our readers for going somewhat far back, and endeavoring, however imperfectly, in what space remains to us, to prove that there is such a science as political economy; that it rests upon a sure basis, and consists of many well ascertained and well defined general laws and principles; that among these is what is usually termed the *laissez-faire*, or let-alone, principle; and that the assertion of this principle, and of all the others with which it is usually classed, is quite consistent with an energetic support of the policy of granting adequate protection to infant manufactures. As the field thus marked out may be too extensive to be traversed within our present limits of time, the subject may be taken up again on a future occasion.

The most obvious, though certainly not the most important, difference between a civilized community and a nation of savages, consists in the vastly greater abundance possessed by the former of all the means of comfort and enjoyment. These means, including the necessaries, conveniences, and luxuries of life, are chiefly material objects, — such as manufactured goods, articles of food and clothing, the useful and the precious metals, and ornaments or things designed to gratify the taste and the senses. Some, however, are immaterial, and yet are just as much objects of desire, just as much objects of barter and sale, as cloth and bread. The legal knowledge and acumen of a lawyer, for instance, the medical skill of a physician, the vocal powers of a remarkable singer, the mimetic talent of an actor, the practised hand of an ingenious and thoroughly trained artisan, — all command a prize in the market quite as readily as any goods in a shop. When an occasion arises, we buy the services of a lawyer, just as we buy a ticket to a concert, or an instru-

ment of music for a drawing-room. Now, the aggregate of all these things, whether material or immaterial, which contribute to comfort and enjoyment, and which are objects of frequent barter and sale, is what we usually call wealth; and individuals or nations are denominated rich or poor according to the abundance or scarcity of these articles which they possess, or have at their immediate disposal.

Two questions may be asked as to the production of these articles of wealth: — (1.) By what mechanical processes are they manufactured or obtained? To answer this query is the business of a man of physical science, a chemist, a mechanic, a farmer, or the like; as political economists, we have nothing to do with it. But, (2.) we may ask, On what principles do men readily exchange these articles for each other, and what motives, what general laws, regulate their production, distribution, and consumption? Political economy undertakes to answer this question, and is therefore properly considered as one of the *moral* sciences. It depends, quite as closely as politics and ethics, upon the principles of the human mind. It is quite as possible to reduce to general laws the habits and dispositions of men, so far as they are manifested in their efforts for the acquisition of wealth, as it is to develop from observation and consciousness the laws of our moral condition. The study of ethics and of intellectual philosophy, strictly so called, does not exhaust the study of human nature. We have yet to learn what are the principles of human conduct in reference to the outward means of supporting man's life and satisfying all his wants and desires. Political economy is founded on observation of the manner in which the independent members of any society act towards each other in the attempt to create or acquire these means. It begins with the supposition, that man is disposed to accumulate beyond what is necessary for the immediate gratification of his wants, and that this disposition, in the great majority of cases, is in fact unbounded; that man's inclination to labor is mainly controlled by this desire; that he is constantly competing with his fellows in this undertaking; that he is sagacious enough to see what branches of industry are most profitable, and eager enough to enter them, so that competition constantly tends to bring wages and profits to a level. The science, then, is more closely allied with the philosophy

of the human mind than with natural history or the physical science of the outward world. It has been called *Catallactics*, or the 'Science of Exchanges;' and, agreeably to this notion, man himself has been defined to be 'an animal that makes exchanges;' "as no other, even of those animals which, in other points, make the nearest approach to rationality, has, to all appearance, the least notion of bartering or in any way exchanging one object for another."

With regard to the articles that constitute wealth, it is to be remarked, that far the larger portion of them are perishable, or quickly consumable. Some of them, like the immaterial products, are consumed at the instant that they are produced; others, like articles of food, last a little longer, but perish if not quickly used. The fashion and the fabric of manufactured goods soon decay, the former being even more short-lived than the latter; tools and machinery wear out; houses and other buildings need constant repairs, and, at stated intervals, must be wholly renewed. Hardly any thing but the solid land itself, the great God-given, food-producing machine, is permanent; and the *exchangeable value* even of the land, (the only quality of it which we have to consider in this science,) quickly diminishes, and almost wholly disappears, if it be not "kept in heart" by the constant application of labor and capital, or maintained in value by the continued prosperity of the community who live upon it. Some land in State Street is now worth $40 a square foot; but if the other items which constitute the wealth of Boston, the ships in her harbor and the goods in her shops, were not perpetually renewed, that land would deteriorate in price with fearful rapidity; and when the city should be reduced to the population and business of a small and decaying village, that land would not be worth $40 an acre.

Wealth, then — and we may crave attention to the proposition, for it is an all-important one — wealth must be perpetually renewed, or it quickly diminishes and disappears. The stock of national wealth is like the flesh, blood, and bones of a man's body, which are in a state of constant flux and renovation; physiologists tell us, that our bodies are entirely renewed about once in seven years. But the riches of an opulent community are not so long-lived even as this. Let labor universally cease in that community; let every

man, woman, and child in it rest with folded arms, or do nothing but eat, drink, and be merry, and those riches would melt and waste like snow under a July sun. National wealth, then, may be more fitly compared to a given portion, a section, of the waters of a running stream, bounded by a few rods in length of the opposite banks. The water is always changing, yet in one sense is always the same, so long as the supply from above is maintained; but if the springs in the upper country should be suddenly dried up, the efflux below would drain the channel in an hour.

And herein is one striking exemplification, among a thousand others, of the inordinate folly and ignorance of those who cry out against the institution of property, and call for an equal distribution of all the wealth of a community among all its members. "Riches have wings" in a far more immediate and practical sense than these people are at all aware of. They always talk as if the national wealth was a fixed and imperishable quantity, like the land, the sunlight, and the air, — but as if, unlike these, it was monopolized by a few, though sufficient for the wants of all. Their blunder is quite as great as would be that of a raw countryman, who, after walking the whole length of Quincy Market on the Mondays of two successive weeks, and observing that the stalls presented almost precisely the same array of meats and vegetables, in the same order, should conclude that there had been no change, and that, as here was a permanent stock of food enough for all, while some families in the city were suffering from hunger, a general and equal distribution of this stock, without compensation to the owners, should be ordered, under the idea that it would make any future want of provision impossible. The possibility that this great store might all be consumed in one day, and that the dealers, deterred by this spoliation, might not supply the market at all on the next day, would never occur to him.

This great and pregnant truth, that the whole stock of national wealth is in a constant and rapid process of consumption and reproduction, is quite generally lost sight of, because we see that the fortunes of individuals, the aggregate of which constitutes the national stock, are comparatively permanent, and, *as it seems*, do not need to be perpetually renewed. If once raised considerably above a mere compe-

tency, and then 'invested,' as the phrase goes, with ordinary care and judgment, a man's property will continue apparently without change, all the while yielding its regular income or increase. If its owner be not a spendthrift, an inebriate, or a simpleton, it will supply his wants and gratify his tastes, and still grow by a steady and sure process of accumulation, the savings of income being added to the capital, without ever encroaching upon his leisure, or requiring him to superintend a change of its form. How can this fact be reconciled with the principles that have just been stated respecting the nature of all wealth? The answer to this question, the solution of this problem, brings us at once to the heart of our subject.

It is the property, the ownership, that is unchanged, and thus the fortunes of individuals remain intact; the articles which are the subjects of that property, which are owned, are constantly changing, are used up and then renewed, without the owner's coöperation, and even without his knowledge. Barring casualties, unlucky investments, and the like, which, being few and infrequent, may be left out of the account, no man's property is consumed without being replaced by the very act of consumption, unless he himself, consciously and wilfully, consumes or expends it *unproductively*, that is, upon the gratification of his own tastes and appetites, without looking for a return or replacement. To invest one's savings is to *lend* them; not having time, inclination, or perhaps ability, to use them reproductively to advantage, — that is, to superintend the constant changes of form which they *must* undergo, or quickly perish, — we lend them to others, who *can* and will direct their transformations, on condition of receiving a small portion of the profits of these changes. For it is also the nature of wealth, when well managed, to *grow*, or increase, by each change of form. *Mobilitate viget, viresque acquirit eundo.*

To make this clearer, we will analyze a single instance, — the simplest one that can be found. If the earnings of an ordinary laborer for a year amount to $300, he may expend them all upon food, clothing, and amusement; in this case, he spends them all unproductively, — that is, without expecting a return or replacement of them. At the year's end, all the advantage which *remains* to him from his year's labor is, that his strength, health, and spirits are renewed or replaced,

so that he can now go to work and earn another year's wages. But suppose that he is frugal and ambitious to grow rich. He will then contract his daily expenses, drink nothing but water, give up all amusements, and thus, at the end of the year, find that his health and spirits are even greater than before, and that he has saved perhaps $100, or one third of his earnings. What will he do with this $100? In a rude state of society, among a half-civilized people, or under the government of a Turkish pacha, property being insecure, he would probably obtain it in the form of gold or silver coin, and bury it in the corner of his cellar or garden. There, sure enough, it would remain without change, and *therefore* without income or increase. But in this country, in England, France, or any commercial and manufacturing community, he would put it in the savings' bank; that is, he would *lend* it to the bank, which, for shortness, we will suppose to be a bank both of savings and discount. In consequence of this loan, the bank will be able to discount or lend $100 more to one of its customers. Suppose a baker wishes to extend his business, but has not capital enough of his own to buy more flour with; he borrows this $100 of the bank for four months, and with it he immediately purchases twenty barrels of flour more than he could otherwise have purchased. What he borrows of the bank is not, in fact, the $100 bank bill which is handed to him across the counter, but the twenty barrels of flour which he buys with it; the bank bill being only a ticket or certificate, in which the bank directors say to the flour-dealer, deliver this man twenty barrels of flour, and we will pay you for it. The flour-dealer complies, and immediately carries back the bill to the bank, and is paid for it, either in hard specie, in that amount carried to his credit, or in any other form that he may prefer. We may put aside, then, in future, any consideration of the bank bills, for they are nothing but "tickets of transfer," or orders from the bank to any merchant, asking to deliver the bearer a certain amount of goods, and the bank will pay him for them.

But let us follow the laborer's $100 of savings; in what shape do they now exist? Evidently they have now become twenty barrels of flour, which the baker gradually transforms into many loaves of bread, and sells them to his customers. Before the four months expire, the bread is all sold and

eaten, so that the $100 are now fairly consumed. But has their value disappeared? By no means. The baker's customers have paid him for this bread at least $120, so that he can now repay the bank the $100 that he borrowed, with the addition of $2 for four months' interest, and put $18 into his own pocket as the reward of his labor. The bank, being again in funds, can now lend, we will suppose, $102 worth of leather for four months to an enterprising cordwainer, who begins immediately to manufacture it into boots and shoes. Before *his* four months have expired, these are all sold, (half of them, perhaps, are half worn out,) and he has received, we will suppose, $225 for them, so that he can now repay the bank its loan of $102, besides $2 and a fraction, for interest, pay his workmen probably $100, for a good deal of labor was needed for the consumption of that amount of leather, and put a little more than $20 into his own pocket. At the end of eight months, then, the bank has a little over $104, to let out for another period of four months. A paper-maker borrows this, buys rags with it, makes paper out of them, sells it, and with the proceeds he pays the bank $106 and a fraction.

The year has now expired, and our frugal laborer, having occasion to make a different use of his savings, goes to the bank for them, and receives $104.50, the institution retaining nearly $2, as compensation for its own agency in the affair. Thus the laborer finds, that, by some process incomprehensible to him, the $100, which he deposited in the bank for a year, has hatched $4.50, which it certainly would not have done, if it had been simply locked up in the vault for safe-keeping. Could he have followed that process, he would have seen his $100 successively becoming, or assuming the shape of, flour, bread, leather, shoes, rags, and paper; and in each of these forms, in turn, he would have seen it entirely consumed or used up. The flour, leather, and rags have been manufactured into corresponding articles, the bread has been eaten, the shoes are half worn out, and the paper is covered with writing or printing, so that a new supply of each is called for. There has been a net gain at each stage of the transaction, and the total gain has been equally distributed among all the parties to it, compensating each for his labor or frugality.

If any one thinks that the instance here analyzed is a trivial or exceptional one, so that it throws little light upon the general theory of wealth, we refer him to the last annual return made to the legislature by the Savings Banks in Massachusetts, which shows that the amount now deposited in these institutions exceeds $12,000,000, that it yields an average annual dividend of nearly 6 per cent., and the number of depositors exceeds 71,600, so that the average amount to the credit of each depositor is less than $170. This aggregate of savings, — made up, be it remembered, by the labor and frugality of Irish domestics, small mechanics, operatives in great manufacturing establishments, day-laborers in the country, and the like, — is more than enough to build and keep in motion all the factories in Lowell; for the aggregate capital of all the great manufacturing companies in that city falls short of eleven millions.

We return to the principle first enunciated, and which now seems to be fully established, — namely, that the whole wealth of a civilized and trading nation is in a constant and rapid process of consumption and reproduction; and that the apparent stability and unchangeableness of the fortunes of individuals offer no exception to this principle. The instance analyzed also proves, that a gain — a profit — an addition to the national wealth — is made only at and by these successive changes of form. What is immovable or unconsumable is also necessarily unproductive. We consume in order that we may produce, and we *must* consume before we *can* produce. If we may reverently quote Scripture on such a topic, "that which thou sowest is not quickened except it die." The wealth which is *literally* locked up or buried, only rots or rusts, and we might just as well bury only stones or sand in its place. But money or wealth is *not* locked up when placed in banks, institutions for savings, "moneyed corporations," as they are called, and the like. These institutions are nothing but contrivances for collecting it, setting it in motion, and making it circulate around us like the atmosphere which we breathe. It supplies the lungs of industry, keeps it alive, renders it efficient, and makes all the parts or members of the body politic and social contribute to the sustenance and growth of the whole. The twelve millions in our Savings Banks, and the thirty-five millions of capital in our banks of deposit and circula-

tion, (we speak only of Massachusetts,) do not rest there, but are at this moment circulating around us, driving the wheels of our factories, supplying our mechanics with tools and our tradesmen with goods, building and freighting our ships, bringing to us the productions of all habitable climes, hurrying from one task to another with indefatigable ardor, and assuming a thousand different forms and hues, according to our necessities and our desires.

We have a right to assume, then, that the theory of wealth is a large and complicated one, embracing many curious and difficult problems, and resting upon many general principles or laws, the discovery and development of which constitute a distinct and important science, — the science of political economy. One of these laws, or general facts, — the circulation of capital, — has now been pointed out and briefly elucidated; and it may readily be perceived that it is a fruitful one, pregnant with important conclusions and inferences respecting the institution of property, and the modes of favoring industry and increasing national wealth. If the science has been successfully cultivated, many more such general laws must have been discovered in it, a knowledge of which is all-important to the statesman, the merchant, and the philanthropist. As expounded in the books, whether by Adam Smith, Ricardo, Sismondi, or McCulloch, it may, or may not, be well founded and trustworthy in all its parts. Authorities differ on many points. But these men have not been studying a mere chimera, or wasting their energies in a vain pursuit. There are general laws affecting the production and distribution of wealth, whether they have been discovered or not; and a knowledge of these laws is a very different thing from the practical knowledge, the acquaintance with details, and the natural shrewdness which enable a man to acquire property, and to take good care of it when acquired.

And this leads us to remark, that political economy is not, as some suppose, the art of money-making, any more than meteorology is the art of predicting the weather. It is no *art* at all, but a science; for its immediate end is knowledge, not action, or the guidance of conduct. The meteorologist says that the phenomena of the atmosphere and the weather, irregular as they are in their occurrence, and obscure as to their immediate causes, must depend on the general princi-

ples of gravity and the equilibrium of fluids, and must be referable to general laws, which are legitimate objects of investigation. He may have studied these laws successfully, and still not be so able as an old sea-captain is, who never opened a book on meteorology in his life, to tell what the weather will be the next hour, or the next day. It is a point of as much interest and real importance to know *how* a storm occurs, as to know *when* it will occur. So, after one of those storms in the commercial world which are called 'commercial crises,' we may reasonably seek an explanation of the phenomenon, or the cause of its occurrence, though this knowledge should not enable us to tell when another and similar disturbance will happen.

The general principles of any science are obtained only by abstraction, — by leaving out of view many of the details and particulars, which practically belong to the case, and thus so far simplifying it that we can reason about it with facility. The conclusions at which we arrive by this process are very comprehensive, but do not admit of immediate application. They are true only with certain qualifications and restrictions. They are involved in all the phenomena to which they relate, and have a share in producing them; but they do not constitute the whole of these phenomena. Now, all legislation which is designed to affect the economical interests of a country, or which relates immediately to its commerce, agriculture, or manufactures, is in truth an application of the principles of some system of political economy to practice. It is often a very rash and injurious application of them, because the circumstances which actually limit the principles are lost sight of, and the abstractions by which they were obtained are forgotten. Mischief results; and practical men, seeing that the consequences do not square with the theory, call in question the science itself, instead of attributing the error to the faulty application of it. Hence arises an unhappy dissension between theory and practice, to the lasting detriment of both.

The political economists themselves are somewhat to blame for this result, by pressing too eagerly the adoption of their favorite doctrines, without regard to the particular circumstances of each case. The general doctrine of Free Trade, for instance, which is unquestionably correct when applied to

two nations which are similarly situated in every respect, which have grown up under the same institutions and the same laws, and in which the profits of capital, the wages of labor, and the ratio of population to territory are on nearly the same level, is extended by a hasty generalization to two countries that are contrasted with each other in all these respects, and in its application to which, to say the least, the correctness of the principle is very doubtful. We have in this country the largest extension of the system of free trade which the world has ever witnessed; we have free trade between Maine and Louisiana, between Iowa and Massachusetts; and we have never yet heard it doubted that this liberty of commerce was equally beneficial to all these States. But before the system is carried out between England and the United States, we may reasonably inquire whether it will not necessarily tend to an equalization of profits and wages in the two countries, and whether it is desirable here that the rates of both should be reduced to the English standard. We do not now undertake to decide the question; politicians and other wise men differ about it. But we may say, that the question does not relate to the correctness of the general principle in economical science, but only to its applicability under particular circumstances. That all bodies gravitate to the centre of the earth is a general law, which is not disproved by the floating of a cork in a basin of water. We may reasonably ask in both cases, whether the apparent exception may not be found, on a closer examination, to confirm the rule.

Another prejudice against economical science has arisen from an error of the opposite character, — from too strict a limitation of it to the causes affecting the increase of national wealth, the other interests of a people being undervalued or wholly neglected. The English economists of Ricardo's school have most frequently fallen into this error; looking merely to the creation of material values, they have tacitly assumed that this was the only interest of society, the only end which legislation should have in view. The proposition on which they act, though they seldom directly enunciate it, is, that the augmentation of national wealth is at once the sign and the measure of national prosperity. We may admit that it is so, if the wealth be distributed with some approach

to equality among the people. But if the vast majority of the nation is beggared, while enormous fortunes are accumulated by a few; if pauperism increases at one end of the social scale as rapidly as wealth is heaped up at the other; then, even though the ratio of the aggregate wealth to the aggregate population is constantly growing larger, the tendency of things is downward, and sooner or later, if a remedy be not applied, society will rush into degradation and ruin.

There is a danger, from which no civilized community is entirely free, lest the several classes of its society should nourish mutual jealousy and hatred, which may finally break out into open hostilities, under the mistaken opinion that their interests are opposite, and that one or more of them possess an undue advantage, which they are always ready to exercise by oppressing the others. Twenty years ago, Archbishop Whateley pointed out the full extent of this danger in a single pregnant question: — "Can the laboring classes — and that, too, in a country where they have a legal right to express practically their political opinions — can they be safely left to suppose, as many a demagogue is ready, when it suits his purpose, to tell them, that inequality of conditions is inexpedient, and ought to be abolished; that the wealth of a man, whose income is equal to that of a hundred laboring families, is so much deducted from the common stock, and causes a hundred poor families the less to be sustained; and that a general spoliation of the rich and an equal division of property would put an end to poverty forever?" Under these circumstances, we may ask further, can we safely neglect to explain and teach the great truths which political economy has demonstrated, that all classes of society are inseparably bound together in a community of interest; that the prosperity of each depends on the welfare of all; that the national industry must be meagre or profitless in its results, if it has not capital or concentrated wealth to coöperate with it; that an equal division of property would in fact destroy or dissipate that which was divided; and that the only equality of condition which human nature renders possible is an equality of destitution and suffering?

We need not apologize for the science which treats of the creation of wealth, on the ground that it relates only to one of the lower interests of humanity, and that it is not of so

much moment for an individual or a society to be rich, as it is for it to be wise, free, instructed, and virtuous. It is true that wealth is one of the lower elements or supports of civilization; and that the comparative quantity of it is but an imperfect index of national worth and national happiness. But it is also true, that wealth is that element of civilization which supports all the others, and that, without it, no progress, no refinement, no liberal art, would be possible. Without property, without large accumulations of wealth, no division of labor would be possible; and without the division of labor, each man must provide by his own toil for all his bodily wants. He must plant, sow, and reap for himself. He must be his own tailor, shoemaker, housewright, and cook. The scholar could no longer devote himself exclusively to his books, the man of science to the observation of nature, the artist to the canvas or marble, the physician to the cure of diseases, or the clergyman to the care of souls. All would be bound alike by the stern necessity of daily brutish toil on the most repulsive tasks. National wealth is a condition of progress, a prerequisite of civilization; it is not in itself ennobling, but it is that which vivifies and maintains all the other elements and influences which dignify humanity and render life desirable.

Even if popular ignorance and prejudice upon this subject were not dangerous to the state, a liberal curiosity would not rest without some knowledge of the laws affecting the creation and production of wealth, — laws which are, in truth, as constant and uniform as those which bind the material universe together, and evince the wisdom and goodness of the Creator quite as clearly as any of his arrangements in the organic kingdoms. Blanco White, speaking of the inattention of the ancients to the philosophy of wealth, compares their state of mind to that of children in the house of an opulent tradesman, who, finding the comforts and necessaries of life supplied to them with mechanical regularity, never inquire into the machinery by which these effects are produced, or, if they ever do think about it, suppose that breakfast, dinner, and supper succeed one another by the spontaneous bounty of nature, like spring, summer, and autumn. It is true, that men are usually selfish in the pursuit of wealth; but it is a wise and benevolent arrangement of Providence, that even

those who are thinking only of their own credit and advantage, are led unconsciously, but surely, to benefit others. The contrivance by which this end is effected, this reconciliation of private aims with the public advantage, is often complex, far-reaching, and intricate, and thus more strongly indicates the benevolent purpose of the Designer. In the instance already given, we have seen that the wealth of an individual, perhaps a sordid and covetous one, invested by him with a view only to his own advantage and security, and to spare himself the trouble of superintending it, still circulates through the community without his knowledge, supporting the laborer at his task, supplying means to the ingenious and the enterprising for the furtherance of their designs, and assuming with facility every shape which the necessities or the convenience of society may require.

We borrow, with some abridgment, a simpler and more striking illustration of the same great truth from Whately.

"Let any one propose to himself the problem of supplying with daily provisions of all kinds a city like London, containing about two millions of inhabitants. Let him imagine himself a head commissary, intrusted with the office of furnishing to this enormous host their daily rations. A failure in the supply even for a single day might produce the most frightful distress. Some, indeed, of the articles consumed might be stored up in reserve for a considerable time; but many, including most articles of animal food and many of vegetable, are of the most perishable nature. As a deficient supply of these, even for a few days, would occasion great inconvenience, so a redundancy of them would produce a corresponding waste. The city is also of vast extent, — a province covered with houses, — and it is essential that the supplies should be so distributed as to be brought almost to the doors of all the inhabitants. The supply of provisions for an army or garrison is comparatively *uniform in kind;* but here, the greatest possible variety is required, suitable to the wants of the various classes of consumers. Again, this immense population is extremely fluctuating in numbers; and the increase or diminution depends on causes of which some may, others cannot, be distinctly foreseen. Again, and above all, the daily supplies of each article must be so nicely adjusted to the stock from which it is drawn, to the scanty or abundant harvest, importation, or other source of supply, to the interval which must elapse before a fresh stock can be furnished, and to the probable abundance of the new supply, that as little distress as possible may be felt; — that, on

the one hand, the population may not unnecessarily be put on short allowance of any article, and, on the other, may be preserved from the more dreadful risk of famine, which must happen if they continued to consume freely when the stock was insufficient to hold out.

"Now let any one consider this problem in all its bearings, and then reflect on the anxious toil which such a task would impose on a board of the most experienced and intelligent commissaries, — who, after all, could discharge their office but very inadequately. Yet this object is accomplished, far better than it could be by any effort of human wisdom, through the agency of men who think each of nothing beyond his own immediate interest, — who, with that object in view, perform their respective parts with cheerful zeal, and combine unconsciously to employ the wisest means for effecting an object, the vastness of which it would bewilder them even to contemplate.

"It is really wonderful to consider with what ease and regularity this important end is accomplished, day after day, and year after year, through the sagacity and vigilance of private interest operating on the numerous class of wholesale, and more especially retail, dealers. Each of these watches attentively the demands of his neighborhood, or of the market he frequents, for such commodities as he deals in. The apprehension, on the one hand, of not realizing all the profit he might, and, on the other, of having his goods left on his hands, — these antagonist muscles regulate the extent of his dealings and the prices at which he buys and sells. An abundant supply causes him to lower his prices, and thus enables the public to enjoy that abundance; while *he* is guided only by the apprehension of being undersold. On the other hand, an actual or apprehended scarcity causes him to demand a higher price, or to keep back his goods in expectation of a rise. Thus he coöperates, unknowingly, in conducting a system which no human wisdom directed to that end could have conducted so well, — the system by which this enormous population is fed from day to day.

"I say 'no *human* wisdom;' for *wisdom* there surely is, in this adaptation of the means to the result actually produced. In this instance, there are the same marks of benevolent design which we are accustomed to admire in the anatomical structure of the human body. I know not whether it does not even still more excite our admiration of the beneficent wisdom of Providence, to contemplate, not corporeal particles, but rational free agents, coöperating in systems not less manifestly indicating design, but no design of theirs; and though acted on, not by gravitation and impulse, like inert matter, but by motives addressed to the will, yet accomplishing as regularly and as effectually an

object they never contemplated, as if they were merely the passive wheels of a machine. The heavens do indeed 'declare the glory of God,' and the human body is fearfully and wonderfully made; but man, considered not merely as an organized being, but as a rational agent and as a member of society, is perhaps the most wonderfully contrived product of divine wisdom that we have any knowledge of." Whateley's *Lectures on Political Economy.* pp. 103 – 110.

It is on a large induction from such cases as this, that political economists rest their most comprehensive and most noted maxim — the *laissez-faire*, or "let-alone" principle — the doctrine of non-interference by the government with the economical interests of society. True, these interests are in the hands of individuals, who look only to their own immediate profit, and not to the public advantage, or to the distant future. They are not only selfish; they are often ignorant, short-sighted, and unconscious of much of the work that they do. But society is a complex and delicate machine, the real author and governor of which is divine. Men are often his agents, who do his work, and know it not. He turneth their selfishness to good; and ends which could not be accomplished by the greatest sagacity, the most enlightened and disinterested public spirit, and the most strenuous exertions of human legislators and governors, are effected directly and incessantly, even through the ignorance, the wilfulness, and the avarice of men. Man cannot interfere with His work without marring it. The attempts of legislators to turn the industry of society in one direction or another, out of its natural and self-chosen channels, here to encourage it by bounties, and there to load it with penalties, — to increase or diminish the supply of the market, to establish a *maximum* of price, to keep specie in the country, are almost invariably productive of harm. *Laissez faire;* "these things regulate themselves," in common phrase; which means, of course, that God regulates them by His general laws, which always, in the long run, work to good. In these modern days, the ruler or governor who is most to be dreaded is, not the tyrant, but the busy-body. Let the course of trade and the condition of society alone, is the best advice which can be given to the legislator, the projector, and the reformer. Busy yourselves, if you must be busy, with individual cases of wrong, hardship, or

suffering; but do not meddle with the general laws of the universe.

The limitations of this let-alone principle are nearly as obvious as the principle itself. The office of the legislator is not, by his own superior wisdom, to chalk out a path for society to move in, but to remove all casual and unnatural impediments from that path which society instinctively chooses for itself. It is to give wider scope and more facile action to the principle we have just been considering, rather than to hedge and narrow it by artificial limits or petty restrictions. Human laws, if wisely framed, are seldom mandatory, or such as require an active obedience; they are mostly prohibitive, or designed to prevent such action on the part of the few as would impede or limit the healthful action of the many. Vice and crime are stumbling-blocks in the path of the community; they obstruct the working of the natural laws, the ordinances of Divine providence, by which society is held together, and all well-meaning members of it are made to coöperate, though unconsciously, for each other's good. To remove such stumbling-blocks, then, is not to create, but to prevent, interference with the natural order of things. Legislation directed to this end is only a legitimate carrying out of the *laissez-faire* principle.

The enforcement of justice in the ordinary transactions between man and man, which often requires further legislation than is needed for the mere prevention of open vice and crime, is another instance of the legitimate exercise of authority by the government. An individual may not erect a powder manufactory in the midst of a populous village, nor carry on any operations there which would poison the air with noxious exhalations. His neighbors would have a right to call out to him, "let *us* alone; you endanger our lives, and prevent us from pursuing our ordinary occupations in safety."

These are internal impediments to the natural action of society, and as such, the government is bound to put them out of the way; its action for this purpose is widely distinguished from the enactment of sumptuary laws, the establishment of a *maximum* of price, prohibiting the exportation of specie, and other obvious infringements of the *laissez-faire* principle. But it is also the duty of the legislature to guard society against external dangers and hinderances. Men are

separated into distinct communities, the action of which upon each other is not so much restrained by law, or by the natural requisitions of justice, as is that of individuals dwelling in the same community. The law of nations is a very imperfect code, and, from the want of any superior tribunal to enforce its enactments, it is very imperfectly observed. War is either a present evil to be averted or alleviated, or it is a possible future event, the occurrence of which is to be guarded against. For either of these ends, the action of individuals within the community may need to be restrained; for the safety of all, the freedom of all to pursue their lawful occupations without let or hinderance, is not to be imperilled through the avarice or recklessness of a few. Accordingly, not mere restraints upon importation, but an absolute prohibition of intercourse, an embargo on all navigation, are among the legitimate measures, a necessity for which is created by national dissension and hostility.

Independent communities are not always at war with each other; but they are always rivals and competitors in the great market of the world. This feeling of rivalry is whetted by the different circumstances under which they are placed, by the peculiarities in the condition of each, and by the opposition of interests which often grows out of these peculiarities. The legislation of each state is primarily directed, of course, to the protection and promotion of the interests of its own subjects; and thus it often injuriously affects the interests of other nations. There is, therefore, a good deal of retaliatory legislation on the part of different governments. There is often, on both sides, a keen measure of wits in devising commercial regulations which shall affect, or render nugatory, measures adopted by the rival nation, not exactly with a hostile intent, but with an exclusive view to its own interests, and therefore frequently with an injurious effect upon the interests of others. Reciprocity treaties, as they are called, are sometimes formed, to obviate the evil effects upon both parties of this keen spirit of competition, when pushed too far. Now, such retaliatory legislation, so far as it operates upon the members of the very community from which it emanates, so far as it limits or restrains the action of all or a portion of them, is not an infringement, but an application, of the *laissez-faire* principle. It is designed to pro-

cure for them a larger liberty than they would otherwise enjoy; if it is effectual, if it answers its purpose, it removes an impediment created by a foreign state far more serious and extensive than the obstruction which it imposes. It may, indirectly and incidentally, turn industry from one channel to another, and make some changes in the investments of capital. But this change is effected only by opening one channel, which would otherwise, under the effects of foreign competition, have remained entirely closed, and by rendering it possible and profitable to turn capital to other uses than those to which it was formerly limited.

If we suppose that the application of native industry and capital is restricted in its range, not by the legislative policy knowingly adopted by a foreign state for this very purpose, but through the superior natural advantages possessed by that state, the same principle still governs the result. By submitting to a small restraint imposed at home, we get rid of a much larger obstacle to our freedom of action, created either by the commercial regulations, finer climate, more fertile soil, more abundant capital, or larger skill and experience of a rival community. The policy of states leads them to seek independence of each other in their economical, almost as much as in their political, relations; or we might better say, that political independence — that is, the enjoyment of distinct institutions and laws, chosen and established by ourselves — makes it still more desirable and necessary than it was before that we should not be entirely dependent upon foreigners for the supply of great articles of consumption of prime necessity, — that we should have within our own borders, and under our own control, the means of satisfying all our natural and imperative wants. It is not even desirable, that Massachusetts and Ohio should be rendered so far independent of each other, that each could obtain from its own soil, or by the labor of its own inhabitants, all that it can need; for these two States are one in most of their political relations. Members of the same great confederacy, living under the same laws, and each exercising its due share of influence in the national legislature, neither has cause to apprehend the hostile or injurious action of the other. The political ties between them are strengthened by their dependence on each other for a supply of many of the necessaries of

civilized existence. But it is desirable that both should be independent, as far as may be, of the great powers of Europe, with whom they cannot be sure of continued friendly intercourse for any time beyond the present, and from whom they are always separated by a great breadth of ocean, and by dissimilarity of customs, institutions, and laws.

True independence, in an economical point of view, does not require us to forego all commercial intercourse with other nations; this would be rather a curse than a blessing. But it does require that each nation should be able to exercise, within its own limits, all the great branches of industry designed to satisfy the wants of man. It must be able to practise all the arts which would be necessary for its own well-being, if it were the only nation on the earth. If it be restricted to agriculture alone, or to manufactures alone, a portion of the energies of its people are lost, and some of its natural advantages run to waste. To be thus limited in its sphere of occupation, to be barred out from some of the natural and necessary employments of the human race, through the overpowering competition of foreigners, is a serious evil, which it is the aim of a protective policy to obviate or redress. On whatever other grounds this policy may be objected to, it is surely not open to the charge of being an infringement of the *laissez-faire* principle, or a restriction of every man's right to make such use as he pleases of his own labors and capital. Its object is, not to narrow, but to widen, the field for the profitable employment of industry, and to second the working of the beneficent designs of Providence in the constitution of society, by removing all artificial and unnecessary checks to their operation. This view of the effects of a protective policy opens a wide range for comment and illustration.

The increase of capital in any country is most rapid, when, from the variety of employments that exist there, most of its inhabitants are engaged in those occupations for which they are peculiarly fitted by nature, and in which, consequently, their labor is most productive.

If the labor of one practised and skilful artisan is equal to that of at least three raw hands or rude laborers, then it is very much for the economical interests of a country that as many as possible of its inhabitants should be skilled artisans,

and as few as possible should be raw laborers. We say "as many as possible;" because *some* rude labor is always needed. There must be, in every country, some hewers of wood and drawers of water, — some work that tasks a man's thews and sinews very severely, while it affords but little employment to his brains, — such work as is often performed by machines and domesticated animals, but which the circumstances of time and place sometimes absolutely require to be performed by men, — usually by men who are capable of nothing else. There is a large proportion of such work required in agriculture, where one skilful and careful farmer can profitably direct the exertions of a dozen or more hands in such operations as ditching, fencing, making hay, and the like. Many, though not *so* many, laborers of this lowest class are also required in manufactures, where numerous skilled and expert hands require to be waited on by mere porters and hewers, in order that the valuable time of the former may not be wasted on the coarser operations that are necessary. Thus the bricklayer must have his hod-carrier; the driver of the steam-engine must have his fireman; the printing office must have its errand-boys, technically called "devils." There is work even on board a ship at sea, which can only be performed by boys. Commerce demands a higher average of skill and intelligence from those who are engaged in it than any other of the great branches of industry; yet even here, in the various operations subsidiary to the transportation and exchange of goods, there is a considerable demand for this lowest kind of exertion. We say a "demand" for it, because the fact that laborers of this class expect only the lowest rate of wages, causes them to be sought for in preference to all others, when the work is such that they can perform it.

From various causes, there is an abundance of this kind of labor in the market in almost every country. The stinted bounty of nature, casualties that lessen the average capacity, vice, ignorance, and extreme poverty, are among the causes which here keep the supply up to the demand, and in nearly all cases make it go greatly beyond the demand. The only evil to be dreaded is a superfluity of this class of laborers, — a superfluity which sometimes, as at present in Great Britain and Ireland, exists to a frightful extent. Popular education,

as that phrase is commonly understood, meaning the general cultivation of the intellect, though unquestionably a very powerful agent for lessening this evil, is not the only preservative against it. A man wholly uneducated in the common meaning of the word, that is, unable either to write or read, may yet become a very expert workman in the finest and most difficult kinds of manufacture. On the other hand, men may be quite well taught, and still be unable to get any but the rudest sort of work to do, or to obtain employment more than half the time even at that. The Scotch, for instance, are a very well educated people; the standard of instruction among them, *for all classes*, is probably quite as high as it is here in New England. Yet there is as large a surplus of rude labor in Scotland, in proportion to its population, as in England, — probably larger.

The loss which a country suffers by having a large portion of its people condemned to this rude labor, when most of them are capable, or may be made capable, of much finer work or more effective industry, is very great; *so* great, indeed, that we doubt whether any other single cause of national poverty can equal it. Men are differently constituted by nature, or by those circumstances which in early youth determine the bent of their inclinations and the applicability of their powers to one task rather than another. The labor of a people is effectually used only when the field of employment in the country offers scope for every variety of taste and talent, and when no formidable or insuperable obstacles prevent any individual from finding out and performing just that task which God and nature appointed him to do. If agriculture alone is pursued, all the mechanical skill of the people is wasted, — all their fitness for commerce, all their enterprise in trade, is wasted. If four millions are obliged to be rude laborers, when three millions of them might be skilled artisans, the labor of one of the latter being supposed to be equal in value to that of at least three of the former, then the value actually created is to the value which might be created, as four is to ten; in other words, the yearly product of the national industry might be two and a half times as great as it is; and the yearly unproductive consumption need not be at all increased, since, in either case, there would be four millions of people to be supplied with food, clothing, and shelter.

Of course, — and here comes the application of the principle to present circumstances, — the country could afford to pay a higher price for their manufactures for the sake of having the articles manufactured at home. They could afford to spend more, for they would have more to spend.

For illustration, we will take the two extreme cases of Ireland and Massachusetts. To avoid burdening the memory with statistics, we shall employ the nearest round numbers. The population of Ireland, in 1841, was about eight millions; that of Massachusetts, in 1840, was about three quarters of one million. According to the Irish census of 1841, which was taken with extraordinary pains and minuteness, the whole number of *families* in Ireland is one million and a half, of whom one million, or just two thirds of the whole, are engaged in agriculture; and only three hundred and fifty thousand families, or a little less than one fourth of the whole, are employed in manufactures and trade. It is obvious that the agricultural population is excessive, for in England, where agriculture is carried to greater perfection than in any other country on the face of the globe, there is but one agricultural family to every thirty-four acres of arable land, while in Ireland there is one such family to every fourteen acres. Now let us look at Massachusetts; according to the census of 1840, there are but eighty-seven persons here employed in agriculture to every hundred and twenty employed in manufactures, commerce, and the operations subsidiary thereto; that is, less than five elevenths in the former, and more than six elevenths in the latter occupation; while the proportions in Ireland, as we have seen, are two thirds to one fifth. Now contrast the condition of the people in the two countries. The paupers in Massachusetts are about one in fifty of the whole population; but as nearly half of these are recent English or Irish immigrants, principally Irish, the real proportion is about one in a hundred. In Ireland, numbering the wives and children of the day-laborers on the land, and of those who hire farms not exceeding five acres each, the condition of these small farmers being nearly as bad as that of the day-laborers, we have not less than five millions of persons, or nearly five eighths of the whole population, constituting the class of the agricultural poor. But as it is estimated by the best authorities, that *only* one half of the Irish

population subsist chiefly or entirely upon potatoes, the number of those who cannot fall to a lower stage of destitution than that which they now occupy without absolutely starving, may be safely stated at four millions.

Can we, then, attribute this great, this frightful, difference to the different distribution of the bounty of Providence, — to the fact that the Irish are crowded together on land not broad or fertile enough to supply them all with food, while we in Massachusetts are fattening on the spontaneous riches of the earth? According to the estimate which every enlightened man must form of the effect upon national well-being of what are termed "natural advantages," this is not very likely to be the case; but let us look at the facts. Here, where our only natural exports are ice and granite, it is notorious, that we do not raise food enough for our own consumption. We import nearly all our wheat, the chief article of our breadstuffs, and also buy from the other States large droves of cattle. But Ireland raises more food than is necessary for her sustenance, and exports annually vast quantities of provision to England. Her export of cereal grains, chiefly oats, and of other edible products of the soil, steadily increased, from less than eight millions of bushels in 1817, to twenty eight millions of bushels in 1838. The exportation of beef, pork, butter, and other animal products has also gone on increasing, though in a lower ratio. It is certain, then, that the penuriousness of nature is not the source of the difficulty; it is not fertile land which is wanting, but wealth; and the people do not produce *that*, because the field of employment is so limited that nothing but rude labor is possible. There is no opening for the exertion of skill and enterprise, and whatever natural qualifications the people may possess in these respects cannot be developed.

Nearly the whole native population of Massachusetts being occupied with tasks that require skill, care, and ingenuity, we depend for a supply of rude labor almost exclusively upon immigrant foreigners. These do all the coarse work in building our railways and canals, and in the several other occupations that require nothing but muscular strength. The rude labor, to which alone they have been accustomed, has so incapacitated them for higher tasks, that it is now an established principle in our large manufactories, we are told, that the

machines cannot profitably be worked if more than one third of the operatives be foreigners. It is not only more economical to pay the higher wages required by native workmen; foreigners generally, and the Irish in particular, cannot be employed at all, except in that small proportion to the whole number of hands which will make it possible to restrict them to the lower or less difficult tasks. Because our own people are so generally trained to the finer and more productive branches of industry, new expedients are constantly invented by them for performing the drudgery by machines. The locomotive steam excavators, that are often employed on the line of a proposed railroad, and the various contrivances that have been patented for cutting and hoisting ice on our ponds, are instances of this sort of labor-saving machinery. The superfluity and consequent cheapness of rude labor in foreign countries render these expedients unnecessary, and the work is profitably done by hand.

Consider the rapid growth of capital in this state, which is the result of this most effective application of its industry, and also the immense unproductive consumption of the people, — their ample supply, not only of the necessaries, but of the comforts and luxuries of life; and contrast these with the poverty and destitution of Ireland. The productive part of the consumption leads to the increase of the national wealth; the unproductive part is an index of the general well-being of the community. In Ireland, the people are literally too poor to create a demand for any thing but potatoes; and the country therefore affords hardly any market either for British or Irish manufactures. There is but little opening there for the mechanic arts, or for the many small occupations which are created by a due regard for the comforts and conveniences of life. The field of employment for skilled industry is consequently limited almost to a span, and the bulk of the people are driven back upon rude labor in agriculture, — to ditching, cutting turf, and planting potatoes; the meagre returns from such toil being hardly sufficient to keep them from starvation. The United States, on the other hand, afford a better market for manufactured goods than any other country of equal population on the globe; because the universal prosperity of the community enables them to consume more. If the relation of cause and effect in this proposition be reversed,

so as to say that the people consume more because they produce more, it will amount to the same thing, and be equally favorable for the purposes of our argument. More wealth is created, more is consumed, and the amount of enjoyment is thereby increased.

Unquestionably, we pay a somewhat higher price for our manufactured goods, as a return for the privilege of manufacturing them at home, and thereby having a field of employment for our skilled labor. But what does this tax amount to? The average duty levied by the present tariff on our chief articles of import is less than thirty per cent. But as one of the chief objects of a protective duty is to guard against the injurious fluctuation of prices in foreign markets, whereby we might be deluged with imported goods one year, and be very scantily supplied with them the next, the duty is fixed with reference to the lowest price at which they are ever sold abroad, and not with reference to the average price. The effect of a protective duty of thirty per cent., then, at the utmost, is to raise the average price fifteen per cent.

Whenever we have occasion for any of these small articles, we are obliged to spend a dollar for what might be obtained for eighty-five cents, if we would buy of foreigners; that is, we might save this fifteen cents, if we were willing to give up all our home manufactures, all opportunity for earning high wages by the exhibition of skill and ingenuity, and to confine the whole people to the comparatively rude pursuits of agriculture, thereby overstocking the market with food, and reducing the gains of farmers all over the country. Ireland has acted upon this rule, laid down by most political economists, — always to buy in the cheapest market, whatever may be the effect upon domestic enterprise. Grain and other provision can be raised most cheaply in Ireland, owing to the low rate of wages there; manufactures can be produced to best advantage in England, owing to the abundance of English capital. Ireland, therefore, raises food to buy English manufactures with; and the present condition of the Irish people is the consequence. They have the advantage, it is true, of the offer of the manufactured goods at prices fifteen per cent. less than what they command in America; — an advantage which would be more sensibly felt, if the Irish were not too poor to purchase them at any price.

The proposition, we think, can be laid down as a general one, that a country, the population of which is chiefly or altogether devoted to agriculture, cannot become wealthy, whatever may be the fertility of its soil or the favorableness of its situation. Of course, its inhabitants must buy manufactures with food; that is, they must exchange the products of rude labor for the products of skilled labor; that is, again, they must give the labor of three persons for the labor of one person. The general principle of economical science is, to cause the industry of a country to take that direction in which it can be applied to the greatest advantage. Now the fertility of the soil is one advantage, and the capacity of the people for the higher departments of labor, their skill and enterprise, is another. There is no reason for allowing either of these advantages to remain latent or unworked; and in choosing between them, we are to be decided by their comparative amount and importance. Fortunate as this country is in the extent of its territory and the richness of its soil, this advantage is as nothing, — nay, it would turn out to our positive detriment, — if, in consideration of it, we should sacrifice the talents and the energies of our people, — if we should doom our whole population to the rude labor of turning up the earth, for the sake of the trifling advantage of purchasing our manufactured goods at a little lower price.

One mode in which the encouragement of skilled labor, leading to the interfusion of manufactures and commerce with agriculture, favors the increase of national capital, is, that it concentrates the population in cities and towns. Agriculture is necessarily diffusive in its effects; the laborers must be distributed over the whole face of the territory which they cultivate. A few large cities spring up at great distances from each other, as an outlet for the commerce created by the exchange of the surplus agricultural products for manufactured goods and other necessaries brought from abroad. The great agricultural districts of continental Europe, the wheat-plains of Poland and southern Russia, find an outlet at the cities of Dantzick and Odessa; and we may remark in passing, that the poverty and general low condition of the inhabitants of these districts show the effects of confining a whole population to the rude labor of tilling the ground. It may be that, from their low capacity, and their want of edu-

cation and general intelligence, they are incapable of any thing better. If so, the fact only strengthens our argument; wherever the capacity exists, if it be not developed, if a field of employment be not offered to it, the same results must follow. Manufactures and commerce, on the other hand, requiring a great division of labor, and also that the participators in the work should be near each other, necessarily create a civic population. They will only flourish in cities and towns, and they are the only means of creating cities and towns.

This principle, perhaps sufficiently obvious in itself, is strikingly illustrated by the differences among the States of this Union. Our southern and southwestern States are almost exclusively agricultural; and south of the northern boundary of Virginia and Kentucky, there is but one city, New Orleans, of the first class, numbering over 100,000 inhabitants, and but two cities of the second class, Charleston and Louisville, each numbering over 25,000. These cities, of course, have sprung up from the same causes which sustain Dantzick and Odessa; they afford an outlet for the surplus produce of the vast agricultural district which depends upon them; manufactures have hardly contributed at all to their growth. If we reckon as civic population those only who dwell in cities having at least 12,000 inhabitants each, Massachusetts alone, with a total population of only three quarters of a million, has a greater civic population than all these States, who number in the aggregate over six millions. Our civic population is nearly one half of our whole number; theirs is about one twentieth of the whole. The cities in this State have been created almost entirely by manufacturing enterprise, Massachusetts not being remarkable for surplus agricultural produce. Wherever there is a considerable fall of water, affording power to move machinery, there a new city springs up, though the soil in the neighborhood should be as barren as the desert of Sahara. But, under the demand for agricultural produce created by that city, the dry sand and the hard rock are converted into gardens of fruit and vegetables; while the plain of eastern Virginia, once almost unsurpassed for fertility, its powers being now exhausted, is relapsing in part into its primitive wild condition, — absolutely becoming a jungle for wild beasts to dwell in.

Cities and towns are the great agents and tokens of the increase of national opulence, and the progress of civilization. The revival of effective industry, which preceded, and in part caused, the revival of learning in Europe, took place through the agency of the free towns and great trading cities, which sprang up most numerous in Germany and Italy, where they afforded a refuge for the arts and the pursuits of peace. Their establishment was the first effective blow given to the feudal institutions of the continent. Commerce and manufactures, to which their walls afforded protection against the chances of war and the rapacity of the warlike nobles, "gradually introduced order and good government, and with them the liberty and security of individuals, among the inhabitants of the country, who had before lived almost in a continual state of war with their neighbors, and of servile dependency upon their superiors. By affording a great and ready market for the rude produce of the country, they gave encouragement to its cultivation and further improvement." The word *civilization* itself, as if to indicate the origin and home of the thing, is derived from *civis*, the inhabitant of a city. Sismondi attributes the greater humanizing and civilizing influence of the colonies of the ancients over those of the moderns to the fact that the former founded cities, while the latter spread themselves over much land. In the town, man is in presence of man, not in solitude, abandoned to himself and his passions. The history of the colonization of the borders of the Mediterranean, he says, might also be called the history of the civilization of the human race.

The Egyptians, the Phœnicians, the Greeks, and the Romans successively formed colonies upon the same general plan. Each of these nations became in succession the leaders, the masters, of the civilized world, in refinement, learning, and the arts; and the colonies which they established were the means of diffusing these blessings among the rude tribes within whose territories the new settlements were formed. When the mother country became too populous, when the inhabitants of its wall-enclosed cities became straitened for room, detachments of them were sent out to found new homes for themselves on the coasts of other lands. The colony was to take care of itself, to be independent of the mother country, from the outset. Hence, to protect them-

selves against the savage tribes among whom they came to dwell, they were obliged, as the first step, to build a city and encircle it with fortifications. Within its walls they all slept; and they did not wander so far from its precincts during the daytime but that they could at any hour hear the trumpet-call, which, like the alarm-bell of modern times, might summon them back to the defence of the walls. Hence they cultivated only a narrow territory, lying within sight of, or at a short distance from, the city; and to obtain food from this restricted space for their whole number, they were obliged to exhaust all the arts of cultivation upon it; it was tilled, and it bloomed, like a garden. For greater security, a portion of it was generally enclosed within the fortifications. This *pomœrium*, or cultivated space under the walls, was usually divided into small strips, and allotted to the several heads of families among the citizens. A portion of the colonists devoted themselves to tillage, and raised food enough, or nearly enough, for the whole city. A larger portion within the walls applied themselves to the mechanic arts and to commerce, exchanging their manufactured goods for food either with their own agricultural citizens, or with the native inhabitants of the soil, when they could open peaceful intercourse with them, or with the denizens of other shores, perhaps of the mother country, to which they sent their ships. As they needed only a narrow strip of territory, which they often obtained by fair purchase from the aborigines, the hostility of the latter was not excited; and the mutual benefits of trade being soon felt, the natives came to regard the colonists as their benefactors and best friends. A knowledge of the arts, a taste for the comforts and luxuries of life, learning, and religion, were thus diffused among them; and in their simplicity and gratitude, they often reverenced the authors of their civilization as superhuman beings, and paid them divine honors. Many, if not most, of the gods and goddesses of ancient mythology were originally only the founders of art-bringing, knowledge-and-religion-diffusing colonies, whose beneficent influence, handed down to grateful remembrance by tradition, — by the spoken, not the written word, — really seemed to admiring posterity divine. The colony, the city, was opulent and refined from the beginning; founded by the most enterprising citizens of the mother country, who brought their

wealth, their cultivated tastes, and their industrious and adventurous habits along with them, it became almost at once a rival of the parent city in learning, industry, and the arts. Temples and theatres were built; the drama flourished; schools of eloquence were established; manufactures of costly and elegant fabrics were begun; and commerce started into life with all the vigor of youth and the large resources of manhood.

Brief as this sketch is, the classical reader will recognize in it, we think, the principal features of those colonies which the Phœnicians established along the northern shore of Africa, the Greeks along the coasts of Asia Minor, Sicily, and Magna Græcia or Southern Italy, and the Romans in Gaul and Spain. Carthage, the great commercial and manufacturing city of ancient times, the rival of Rome, may be taken in its history as a type of them all; and in the fanciful picture which, many years after its destruction, the Roman poet drew of its supposed origin, of the scene which it presented while the walls of the city were building, we recognize what was the idea, even so late as Virgil's time, of the mode of founding a colony.

"Conveniunt, quibus aut odium crudele tyranni,
Aut metus acer erat; naves, quæ forte paratæ,
Corripiunt, onerantque auro; portantur avari
Pygmalionis opes pelago: dux fœmina facti.
Devenêre locos, ubi nunc ingentia cernes
Mœnia, surgentemque novæ Carthaginis arcem:
Mercatique solum, facti de nomine Byrsam,
Taurino quantum possent circumdare tergo."

. . . . . .

"Jamque ascendebant collem, qui plurimus urbi
Imminet, adversasque adspectat desuper arces.
Miratur molem Æneas, magalia quondam;
Miratur portas, strepitumque, et strata viarum.
Instant ardentes Tyrii: pars ducere muros,
Molirique arcem, et manibus subvolvere saxa;
Pars optare locum tecto, et concludere sulco.
Jura, magistratusque legunt, sanctumque senatum.
Hic portus alii effodiunt; hic alta theatris
Fundamenta locant alii; immanesque columnas
Rupibus excidunt, scenis decora alta futuris."

Modern colonies, on the other hand, are, from the outset,

dependencies of the mother country, to which they constantly look for protection and support. They are often planted by those who do not intend to reside there permanently, but simply wish to gather again in a new country the wealth which they had dissipated in an old one, and then to return to their former home in order to enjoy it. Thus relieved from all fear of attack from the aborigines, their first care is to get possession of as much land as possible, this being the most obvious and plentiful source of riches. Individuals or joint-stock companies obtain grants of land measured by the league; and their rapacity provokes the vengeance of the natives, at the same time that it leads to their own isolation and defencelessness. The territory which they acquire is out of all proportion to their wants, their physical strength, or their capital; they cultivate only here and there a very fertile spot, where the powers of the soil are soon spent by a succession of exhausting crops; and in the careless style of agriculture to which they become accustomed through their dependence on the extent and natural richness of their land, is soon lost all remembrance of the agricultural art and science which they brought with them from their old home. Widely separated from each other, amply supplied with food by the bounty of nature, but destitute of the manufactured articles on which depend the comforts and even the decencies of life, out of the reach of the law, and beyond the sphere of education, they rapidly approximate the condition of the savages whom they have just dispossessed. They become "squatters," "bushmen," "backwoodsmen," whose only enjoyments are hunting and intoxication, whose only school-room is the forest, and whose sense of justice is manifested only by the processes of Lynch law. They are doomed to the solitary, violent, brutal existence, which destroys all true civilization, all sympathy with other men, though it increases strength of body, adroitness, courage, and the spirit of adventure. The want of local attachments, and an insatiable thirst for wandering and adventure, are, we fear, the most striking traits in the character of the whole population of our Mississippi valley. Their homes even in that fair region are but homes of yesterday; they had only pitched their camps on the banks of the Ohio and the Wabash, while on their way to the Sacramento and the Columbia. The truant disposition,

which carried them over the Alleghanies, hurries them onward to the Rocky Mountains. We do not go so far as an eminent thinker of our own day, who has expressed in eloquent language his fears, lest these constant migrations should lead our countrymen back to barbarism; but it is certain, that the "pioneers of civilization," as they have been fondly called, leave laws, education, and the arts, all the essential elements of civilization, behind them. They may be the means of partially civilizing others, but they are in great danger of brutalizing themselves.

Strangely enough, the only colony of modern times, founded on the principles which governed the ancients in the establishment of their colonies, is one commenced by a set of half-crazed fanatics in our own far-distant territory of Utah or Deseret. Here, as well as at their former place of settlement in Illinois, the Mormons appear to have begun their colony by founding a city, within or near which their whole population is to be collected, so that the mechanic arts and all branches of manufacture may be established at the same time that they make their first attempts in agriculture. The name of their present chief city in Deseret is New Hierusalem, and it is situated on the right bank of the Western Jordan, which empties into their Dead Sea. We borrow the following account of it from an Historical Discourse, delivered sometime during the past year, by Thomas L. Kane.

"Its houses are spread, to command as much as possible the farms, which are laid out in wards or cantons, with a common fence to each ward. The farms in wheat already cover a space greater than the District of Columbia, over all of which they have completed the canals and other arrangements for bountiful irrigation, after the manner of the cultivators of the East. The houses are distributed over an area nearly as large as the city of New York. They will soon have completed a large common storehouse and granary, and a great sized public bathhouse. One of the many wonderful thermal springs of the valley, a white sulphur water of the temperature of 102° Fahrenheit, with a head of 'the thickness of a man's body,' they have already brought into the town for this purpose."

It is remarkable, that one of the latest improvements or discoveries in economical science, Mr. Wakefield's theory of colonization, consists in the recognition of the fact, that the

ancient mode of planting colonies is far preferable to the modern one. Mr. Wakefield perceived, that a country cannot have a productive agriculture unless it has a large town population, who may supply the agriculturists with manufactured articles, while the agriculturists supply them with food. Both parties are thus furnished with a market for their surplus produce, and with the articles that they most need in exchange for it. He showed that the modern fashion of establishing new settlements, — "setting down a number of families side by side, each on its own piece of land, and all employing themselves in exactly the same manner, — though under favorable circumstances it may assure to those families a rude abundance of mere necessaries, can never be other than unfavorable to great production or rapid growth." The situation of Oregon hardly five years ago affords a striking illustration of this truth; the settlers, for want of a market, were obliged to feed their horses with the finest wheat, while their own dwellings were destitute of all the comforts of life except food. Wakefield's "system consists of arrangements for securing that every colony shall have, from the first, a town population bearing due proportion to its agricultural, and that the cultivators of the soil shall not be so widely scattered as to be deprived by distance of the benefit of that town population, as a market for their produce." When land was plenty and free emigrants scarce in New Holland, the government found it convenient to make liberal gifts of territory; and accordingly, tracts varying in size from 10,000 to 50,000 acres were granted to various individuals. We borrow from one of the recent numbers of this Review a brief outline of the system:

Mr. Wakefield argued thus:— "The welfare of any community depends very much upon such a division of labor as shall fill every trade, profession, and employment with good men, and not overload any of them. If land in any country is so cheap that all are able to become landholders, there will be no laborers, no farm-hands, or mechanics; a semi-barbarism will follow; no growth in wealth or civilization will take place, and the country will be stationary or retrograde. If, therefore, you would have a colony progressive and civilized, you must put your lands so high as to keep a proper proportion of the inhabitants in the labor-market seeking employment, and yet not so high as to prevent as many from buying real estate as can use it to advan-

tage with the help of such laborers. If, then, England wishes Australia to grow in riches and goodness, let her sell the lands at a fixed price, never taking less, and in fixed quantities, never selling less; and let her apply the revenue arising from these sales to the transportation of free, honest laborers to the points where they are needed. In this way, the labor-market of New Holland will be supplied; the expense of supplying working hands will be paid by the lands of the colony; no more land will be taken up than can be worked to advantage; population will be concentrated, wealth will accumulate, and knowledge and virtue advance."

Mr. Wakefield's theory was good, but a practical difficulty obstructed its application. The government, adopting his views, put their lands up to a high price; and the emigrants, consequently, instead of purchasing them, or of remaining as laborers on the lands purchased by others, pushed farther into the interior, and "squatted" on the best land they could find, without paying any thing. In those vast unsettled regions, they knew very well that they were out of reach of the sheriff. Thus, the very measures adopted for concentrating them, and keeping them within the range of civilization and law, led to their wider dispersion and utter lawlessness.

It is curious that the United States system of disposing of the public lands, adopted in all its essential features as far back as 1800, has worked better than any other plan which has yet been devised. The land is carefully divided by the government surveys into townships six miles square, each of these being subdivided into thirty-six *sections*, of one square mile, or 640 acres, each. All is held at a minimum price of $1.25 an acre; and the sales are made at public auction as rapidly as the progress of the population seems to require. Lands which will not bring $1.25 an acre at the public sale, are still held by the government subject to entry at any future time, at private sale and at the minimum price. Any person can select a quarter, or even an eighth section,— 160 or 80 acres, — wherever he can find one surveyed and not yet sold, and by making a record of his intention to occupy and settle it himself, he can secure what is called the "preëmption right;" — a right which, partly by the force of law and partly by custom, amounts to a privilege of purchasing that land at the minimum price of $1.25 an acre, whenever the government shall think proper to sell it, which it will do when

the settlement is so far advanced as to render it probable that most of the land in the vicinity will bring that price. Thus the actual settler in truth obtains his land on credit, though all actual sales are for cash. He has credit till the actual sale is ordered; and some years may intervene, during which he may proceed to clear and cultivate his land, and actually obtain enough from it to make up its price, secure that no one will overbid him, and that he cannot be obliged to pay more than $1.25 an acre for it, however great may be his improvements. Five per cent. are reserved from the proceeds of the sales, to be expended, — three fifths for making roads to the newly settled territory, and two fifths for the support of seminaries of learning therein.

We say this system has worked well, the only evil experienced under it being, that speculators will sometimes buy up large tracts not subject to preëmption right, at the minimum government price, and hold them for an indefinite period, hoping that, as the population gradually close up and concentrate around them, they may again be brought into market at a much advanced price. While thus held, they remain unoccupied, — broad patches of wilderness among the settlements, — obstructing communication between the surrounding lands, and barring out occupation and improvement. But there is a check to this evil in the fact, that such lands are subject to state taxation, though they are tax-free before they are sold by the United States; and the taxes being proportioned to the rise in value of the property, it is not for the interest of the speculators to retain the land a long time.

But our brethren of the Western States make a great mistake when they clamor for a reduction of the *minimum* price at which the public lands are now held, and even demand that they shall be offered, in limited quantities, as a free gift to actual settlers. Their object, of course, in making these demands, is to stimulate the spirit of emigration to the West, so that the population there may more speedily become dense, and the value of the lands already settled may thus be enhanced. The object is a good one; but if there is any force in the considerations now adduced, the means adopted will tend rather to check than promote its attainment. It is surely not for the interest of sparsely settled States, like Indiana, Illinois, and Michigan, that the great wave of emigra-

tion, though broadened and deepened, should only roll over them, to be arrested at last by the farthest limits of Iowa and Minnesota, or perhaps to pass much farther, and, dashing against the side of the Rocky Mountains, to throw its spray over their summits into Oregon and California. But we maintain that any great reduction in the price of the public lands will surely have this effect. The most eligible land in the three States first mentioned has already been taken up by individuals, that portion which yet remains in the hands of government being either less fertile, or more distant from navigable streams and other means of communication, or situated in a less salubrious or convenient region, than the tracts first selected for purchase. They have long been in the market, and have not yet found a buyer. Even now, most of the emigrants pass by them, seeking public lands which are more remote from their former homes, but which, in every other respect, are superior to these long-neglected spots, which a former generation of emigrants have avoided. Any general reduction of the government price could not affect this relative eligibility of the nearer and more distant lands. Reduce the price to nothing — give away the lands altogether; and the emigrant will still pass on, pushed forward by the emigrant's fond illusion, that the farther from home, the nearer to El Dorado.

Again, what is most needed for an increase of the prosperity of the West, — of that portion of it, at least, which lies on this side of the Mississippi, — is, not that the lands yet in the possession of government should become private property, but that the population should be concentrated on the tracts already owned by individuals, though in great part still covered by the primeval forest. To enhance the value of these broad regions, the people must be massed together, towns and cities must be established, manufacturing and commercial industry must be added to agricultural, and the hut of the backwoodsman must give place to the well-furnished abode of civilized and enlightened man. It would be an ill mode of enhancing the value of the farms of individuals, to offer lands in their immediate vicinity at a nominal price, or at no price at all. The passion for owning land, which converts nearly all the new settlers in our Western States into farmers, however ill fitted for such occupation by their

previous pursuits, is as injurious to agriculture as to the other great branches of industry. The land is held by those who, from defect of experience or want of capital, are unable to develop its resources, or even to remove the forest from a tithe of their domains. Corn, fuel, and meat are abundant, because prodigal nature affords so many facilities for the production of them, that the skill, enterprise, and knowledge of the cultivator are little needed, and are therefore imperfectly called forth. But man does not live by bread alone; and when this alone is supplied, almost without labor and without stint, he learns to do without many of the requisites even of a low stage of civilization, and allows the wants of his higher nature to remain unsatisfied. The want of a market and the consequent surplus of agricultural produce reduce its price so low, that many families find it needless to raise more than is wanted for their own consumption. The difficulty is felt, though its true cause is not ascertained; and a general call is made for improving the means of communication, so as to give access to distant markets, when the real want is that of a market near home. This want can be satisfied only by bringing the people together, and turning one half of them from agricultural to manufacturing and mechanic pursuits. The farmer would then find the number of his competitors diminished, the number of buyers of his produce increased, and the articles needed for his domestic comfort cheapened in price; because most of them would be manufactured in his immediate neighborhood, and the expense of transportation from a great distance would be subtracted from their cost. As it is, the State too often bankrupts itself in the gigantic enterprise of creating a system of railroads and canals, so as to gain access to a manufacturing and commercial population on the other side of the Alleghanies, instead of laboring to create such a population within its own territory. Indiana and Illinois, whose united territory measures about ninety thousand square miles, and whose inhabitants, ten years ago, numbered nearly 1,200,000, had not one town, in 1840, which contained five thousand inhabitants, and but two towns having over four thousand each. Has it been a benefit to these States, that the cheapness of the public lands has recently borne the tide of emigration onward into Iowa and Minnesota, instead of arresting it by the left bank of the

Mississippi? In our opinion, the interests of these States, and of the emigrants themselves, would be most effectually promoted by raising the price of the public lands to a point which would really keep them out of the market for twenty years to come.

Art. VII.—*History of the later Roman Commonwealth, from the End of the Second Punic War to the Death of Julius Cæsar; and of the Reign of Augustus; with a Life of Trajan.* By Thomas Arnold, D. D., late Regius Professor of Modern History in the University of Oxford, and Head-Master of Rugby School. New York: D. Appleton & Co. 1846. 8vo. pp. 552.

2. *A History of the Romans under the Empire.* By Charles Merivale, B. D., late Fellow of St. John's College, Cambridge. London: Longmans. 1850. 2 vols. 8vo.

It is a hackneyed saying, that the ages which furnish the least of history write the most. Nor is it unnatural that this should be the case. An uneventful present, neither offering grounds of interest in itself, nor affording materials for a clear horoscope of the future, can hardly fail to lay a fond and strong hold upon the past. Then, also, eloquence, poetry, and the more fervid forms of literature are inspired and nourished by tumult, war, and revolution; but, when the general mind relapses into quietness, they yield place for the graver muse of history. Still farther, as the most insignificant men are the most ready to boast of their ancestry, and as the stripling who has the least in himself is the most prone to "ape his sire," so does the age which wins little glory of its own, search with the most loving diligence for the title-deeds of its hereditary fame, and trace out with the most reverent regard the footsteps of vanished generations.

But such theorizing seems rebutted by the phenomena of our own times. We certainly have been making history with unprecedented rapidity. The striking events of the last fifty years incomparably outnumber and outweigh those of the

three preceding centuries. The whole realm of art, science, government, and social economy has been in a transition state; and transactions which one month fill the world with amazement are almost forgotten in the crowded budget of the next month. Nor was there ever a generation which made so little use of the past as ours. The perpetually recurring phrase "of the day" is almost necessary to commend opinions, theories, institutions, and reforms to serious regard; and we have even heard and read of "the Gospel of the day," as if that which has nurtured the piety of eighteen hundred years had become effete, and needed revision and readaptation. At the period of the first French Revolution, the precedents of antiquity were not neglected, though they were wretchedly misused. A great deal was said and written about the ancient republics, which furnished names and insulated paradigms for many of the innovations discussed, projected, and established by the successive ranks of destructives and reconstructives. But Red Republicanism has no past; Socialism has no hold on historical epochs; Chartism is autocthonous, and can claim no ancestral tree. The newborn and still nascent constitutions of Europe, though they bear little kindred to Minerva, resemble her in the hot haste of their motherless birth. In fine, in its political, philosophical, ethical, and, to a lamentable degree, in some of its religious aspects, the age tends to self-isolation, and, in ignoring the past, is preparing to be itself ignored by a more loyal future.

By theory, then, affluence in historical writing ought not to be prominent among the literary features of our times. Yet it is prominent. Every department of historical and antiquarian research is pursued with a zeal unknown before. The dust of centuries has been brushed alike from public archives and from public records. Old authorities are collated and sifted, and the test of a skeptical criticism is applied to what have hitherto been undisputed traditions. Myths are reduced to their initial formulæ of fact, while infinitesimal fragments of fact are integrated into their long-lost values. Even dates and trivial details find vehement partisans for their various renderings; and ancient battle-grounds and military routes are traced and measured with a fonder curiosity than attaches itself to Marengo or Waterloo. No man's literary reputa-

tion seems complete till he has written a history; and our own pages have more than once given expression to the vague surmise and half-formed hope, that certain distinguished Americans, who have been second to none in elevating the intellectual standard of their country, are accumulating materials for master-works in this department, to fill up all that is lacking to their enviable fame. It is chiefly on this field that the rivalry of genius between England and America is now contested. Sparks, Prescott, Bancroft, Ticknor, are our foremost names, when we challenge transatlantic comparisons; while voluminous and elaborate histories are chasing one another through the British press, faster than their merits can be canvassed, or their relative rank assigned.

The people, too, indisposed as they are to profit by the past, preyed upon, as they are, by all manner of unfathered absurdities, all read history. Macaulay's England has passed through almost as many editions as the Waverley Novels; and on books of no other class can a publisher afford so large an outlay, or depend upon so rapid a sale. While we are writing, there is laid upon our table the first volume of a cheap, popular edition of Grote's Greece, — a work, which, twenty years ago, would have found its way only into the libraries of professed scholars. Meanwhile, every town and parish, every institution or society that has a past, can find its hundreds of purchasers and readers for its full-sized duodecimo of obscure names, insignificant events, and barren gossip; while even a periodical devoted to genealogies, without the lubricating admixture of "old wives' fables," finds subscribers enough to maintain its place and make its fair show among our more expensive Quarterlies.

Here we have a problem well worth our investigation. Among the causes of the fertility of our times in historical literature, a prominent place is, no doubt, to be assigned to the dearth of materials for imaginative writing. Fact, which used to limp far in the rear, has now overtaken and outspeeded fancy. Poetry and fiction have been almost ostracized by the earth-genius of discovery and invention. Most of our verse is but metrical prose, and novels must be either grotesque or immoral to atone for the lack of originality. There is, indeed, a legion of rhymers, and of novelists in a small or a coarse way; but we could almost count on our

fingers those who, in either department, feel the afflatus of genuine inspiration, or can find unoccupied earth-room or sky-room, or unappropriated materials, for their creations. Meanwhile, the age is too mechanical and skeptical to abound in master-works of abstract reasoning, or of spiritual contemplation. A Fenelon or an Edwards would seem hardly less a *lusus naturæ* than a centaur or a mermaid. The affairs of the present are also exempted from the cognizance of men of the highest culture and ability, by the industry, ingenuity, and copiousness with which they are discussed in the daily press. Therefore, many men of genius and scholarship, who will and must write, are driven to history as the only form of intellectual effort open at once to original research and to the full appreciation of the public.

"Open to original research," we say; for almost all history has needed to be rewritten, and most of the great historical works of preceding generations are already obsolete or obsolescent. Geography, the basis of history, has in our own day first taken its place among the exact sciences. Buried capitals have been discovered and disinterred; the localities of defunct empires are determined with the minutest precision; and this knowledge alone has corrected a multitude of errors in fact, and has given definiteness and coherency to narratives which before were understood vaguely, or not at all. Oriental and classic archæology, also, in the affluence of its materials and the exactness of the results, seems like the growth of yesterday, so meagre and unsatisfying do previous researches appear when compared with the most recent. Then, too, historical criticism can hardly be deemed to have had its birth prior to Niebuhr's labors on Roman history. The old method was to place equal reliance on whatever authorities bore the seal of venerable antiquity, even though they might treat of times long antecedent to their own, and generally to shun the task of reconciling discrepancies by consulting as few original authorities as possible. Legend was incorporated freely with undoubted fact, and the nearest event compatible with the laws of nature was assumed as the actual basis for every supernatural tradition. Mythologies were unsparingly blended; and the strongly marked distinction between the Greek and Roman pantheon was scarcely recognized or imagined. Much less were the various renderings

of mythical traditions placed side by side, and traced back to their respective sources, so as to receive light from, or to cast light upon, the primeval history of the states of Greece or the Italian colonies. Similar remarks apply to the mediæval ages, which can hardly be said to have been the subject of scholarly investigation by any writer previous to Hallam. Thus, the vast accumulation of various kinds of subsidiary knowledge by travellers, antiquaries, philologists, and critics has made history a *tabula rasa*, and left in the world's literature a chasm which it remained for this generation to fill.

Different ages, also, make widely different demands of history. When war was the great interest of governments and nations, (and this seems to have been the case until the fall of Napoleon,) the chief thing required of the historian was, that he should be a chronicler of battles, sieges, insurrections, and revolutions; and it is amazing how pacific intervals of development and progress were hurried through, with hardly a mention of the discoveries and inventions which recreated science, transfigured art, stimulated industry, and renewed the face of society. In general, in the earlier histories, events, and not men, — external and international movements, and not the internal condition and changes of society, occupied the foreground. There was little analysis of motive, principle, or character. The actors on the arena were treated like the pieces on a chess-board, — important, not in their own configuration or specific differences, but only in their bearing on the results of the game. But little account was made of man as man. The diffusion of the republican element throughout Christendom has created a different mode of viewing the past, and consequently a new demand from its records. What is now sought is not the number of men killed in a battle, the order of attack or the munitions for defence, but the purposes, passions, and experiences of leaders and armies, kings and nations. The homes of the people, their social condition, their culture, their superstitions, their laws of domestic life, are now objects of eager inquiry. The Helot, the plebeian, the slave, must have his place in the narrative; and intense curiosity hangs around the memorials of such classes of men as used to be counted by the score or the hundred, computed in mass, and unrecognized in their individual capacity and worth. We will venture the asser-

tion, that Macaulay's chapter on the social condition of England in 1685, has contributed more than all the residue of the two published volumes of his history to their marvellous and universal popularity; yet it is a chapter, which, had he written it twenty years ago, would have been curtailed into a brief appendix, or broken up into obscure foot-notes.

In fine, it is the biographical element that is now chiefly demanded in history. This craving accounts for the success, in a proportion but slightly dependent upon their merit, of so many voluminous memoirs of public men. The title, "Life and Times," is enough to set afloat pairs and triplets of huge octavos, laden far below the sinking point with vile gossip, unmeaning correspondence, and "papers of no value to any one but the owner." Even if a man's mind has been a blank or a bog, and his heart arid as Sahara, thousands of readers can be found to drag through the *post mortem* examination, barely for the luxury of having a real subject dissected in their sight.

Now, to meet this demand, history must assume one of two shapes. It must either treat biographically the complex personality of a nation, depicting its sentiments, aims, growth, conflicts, and decline, as those of a single multiform soul and manifold life; or it must resolve itself into a series of individual biographies, with a connecting thread of narrative. The former process demands more genius, and wins the highest applause; but often it sacrifices fact to fancy, abnormal details to the primal conception, and the actual march of events to the reconstructive theory on which they are arranged. The latter requires the more patient research and the larger conversance with existing varieties of character, and is most likely to convey historical truth, inasmuch as nations never move as units, but by the combined action of mutually modifying and counteracting forces.

The two works named at the head of this article furnish respectively striking specimens of these two types of historical composition. Arnold was not, we suppose, a man of profound original research. Indeed, his life was too busy for him to obtain at first-hand a tithe of the materials, which he knew how to elaborate with so much skill and grace. In the earlier Roman history, he was a close follower of Niebuhr; in the later commonwealth, there was less room for skepti-

cism or for peculiar theories of interpretation, the discrepancies as to matters of fact being few and trivial. But what distinguishes him as a writer of history is, the compactness and unity which he imparts to the march of events, so that he always permits us to trace the condition and fortunes of the nation as an undivided whole, presents the resultant force without the minute analysis of its elements, and describes individual actors less in their individual capacity, than as the representatives of national characteristics and tendencies. His sketches even of the most illustrious men, the Gracchi, Julius Cæsar, Augustus, and Trajan, are therefore vague, meagre, and unsatisfying; while his conception of the Roman mind and character, in its initial type, its development and its world-wide influence, is distinct, coherent, and adequate. In his enlarged view of the Providential education of the race, Rome is the principal factor of ancient history, having for its mission to centralize and consolidate all the merely human elements of civilization, power, and grandeur, and thus to subject them to the Divine agency under which, according to the oracle, "one, who should go forth from Judea, was to obtain the empire of the world."

Merivale, on the other hand, seems to have been guided by a happy instinct in the choice of his title; for he is writing the "History of the Romans," rather than of Rome. He fails to preserve the continuity of his narrative. His episodes are so long as to make us forget the point from which they digressed. While describing provincial affairs, he loses sight of Rome. He presents rival leaders and their factions, not in concurrence and contrast, but in succession. He lacks the skill by which all the chief personages and controlling causes of an historical epoch can be kept simultaneously before the reader's eye, and exhibited in interaction, combination, and conflict. He substitutes a series of monologues for the crowded drama of the forum, senate-house, and camp. But he is eminently successful in the biography of individuals. We feel better acquainted with the genius, political relations, motives, and purpose of the subordinate, yet prominent, actors in the last days of Roman liberty, through the medium of these volumes, than by means of all our previous reading. For example, such characters as those of Clodius and Milo have generally been passed by as not worth a labored analysis.

Yet the former must have been endowed with talents as splendid as his life was vile, and needed only some measure of self-restraint to have retained the permanent control of the republic; while the latter, shallow alike in intellect and in character, possessed, no doubt, many of the traits of an accomplished demagogue, and was capable at any time of holding much greater men than himself in subserviency to his intrigues. Now these men, and others on the same or a lower plane of influence in the State, are placed by Merivale within the distinct cognizance of his readers, not only in their political agency, but in their manners, habits, social intercourse, and reputation among different classes of people. He is manifestly not a mere scholar, or rather, he is not exclusively a book-man, but a keen observer of men and society around him; for, while his Romans are neither modernized nor Anglicized, they are actual men, endowed with human passions, affections, and liabilities, and not the impassive abstractions which have so often usurped the Roman name in history.

We may at once illustrate and justify our verdict as to the different merits of these two authors by a characteristic extract from each. From Arnold, we quote a paragraph on the state of literature in the Roman empire under Trajan.

"We have already expressed our opinion, that the merits of Roman literature, even in its most flourishing period, have been greatly overrated; and we believe that a review of its condition at the end of the first century of the Christian era, might tend to lessen our wonder at the ignorance which afterwards prevailed throughout Europe. Our first impression would probably be highly favorable: we meet with the names of a great many writers, whose reputation is even now eminent; we know that learning was not only held in honor in the eastern provinces, where it had been long since cultivated, but that Gaul, and Spain, and Africa abounded with schools and orators, and that a taste for literary studies had been introduced even into Britain. The names of the most distinguished orators at Rome were familiarly known in the remotest parts of the empire, and any splendid passages in their speeches were copied out by the provincial students, and sent down to their friends at home to excite their admiration, and serve as models for their imitation. Even the Roman laws, once so cold and so disdainful of literature and the fine arts, had in some points adopted a more conciliating language; and the profession of a Sophist was a legal exemption from the duties of

a juryman in the conventus or circuits of the provincial judges. The age of Trajanus then had greatly the advantage over that of Augustus in the more general diffusion of knowledge, while, in the comparison of individual writers, the eminence which Virgil and Horace attained in poetry was at least equalled by the historical fame of Tacitus. But although knowledge was more common than it had been a century before, still its range was necessarily confined; nor before the invention of printing could it possibly be otherwise. Pliny expresses his surprise at hearing that there was a bookseller's shop to be found at Lugdunum or Lyons; yet this very city had been for a long time the scene of public recitations in Greek and Latin, in which the orators of Gaul contended for the prize of eloquence. Thus, instead of the various clubs, reading-rooms, circulating libraries, and book-societies, which make so many thousands in our day acquainted with every new publication worthy of notice, it was the practice of authors at Rome to read aloud their compositions to a large audience of their friends and acquaintance; and not only poetry and orations were thus recited, but also works of history. To attend these readings was often, naturally enough, considered rather an irksome civility; they who went at first reluctantly were apt to be but languid auditors; and we all know that even to those most fond of literature, it is no agreeable task to sit hour after hour the unemployed and constrained listeners alike to the eloquence or dulness, to the sense or folly, of another. The weariness then of the audience was to be relieved by the selection of brilliant and forcible passages; their feelings were to be gratified rather than their understandings; and amidst the excitement of a crowded hall and an impassioned recitation, there was no room for that silent exercise of judgment and reflection which alone leads to wisdom. From this habit, then, of hearing books rather than reading them, it was natural that poetry and oratory should be the most popular kinds of literature; and that history, as we have observed in our notice of the Roman historians, should be tempted to assume the charms of oratory, in order to procure for itself an audience. A detail of facts cannot be remembered by being once heard; and many of the most useful inquiries or discussions in history, however valuable to the thoughtful student, are not the best calculated to win the attention of a mixed audience, when orally delivered. The scarcity of books, therefore, inducing the practice of reading them aloud to many hearers, instead of reserving them for hours of solitude and undisturbed thought, may be considered as one of the chief causes of the false luxuriance of literature at Rome in the reigns of the first emperors, and of its early and complete

decay. We have already noticed the unworthy ideas which the Romans entertained of its nature, and how completely they degraded it into a mere plaything of men's prosperous hours, an elegant amusement, and an embellishment of life, not a matter of serious use to individuals and to the state. Works of physical science, and, much more, such as tend to illustrate the useful arts, were therefore almost unknown; so also were books of travels, details of statistics, and every thing relating to political economy. Had books of this description been numerous, it would indeed have been strange if the Roman empire had afterwards relapsed into ignorance. The nations by whom it was overrun would readily have appreciated the benefits of a knowledge which daily made life more comfortable, and nations more enlightened and more prosperous; and the advantages of cultivating the understanding would have been as obvious to men of every condition in Rome, as they are actually at the present time in England, Germany, and America. As a proof of this, we may observe, that the only two kinds of really valuable knowledge which the Romans had to communicate to their northern conquerors were both adopted by them with eagerness; we mean their law and their religion. The Roman code found its way, or rather retained much of its authority, in the kingdoms founded upon the ruins of the Roman empire, and its wisdom imperceptibly influenced the law of those countries which affected most to regard it with jealousy and aversion. And the Christian religion, in like manner, survived the confusion of the fourth and fifth centuries, and continually exercised its beneficent power in insuring individual happiness, and lessening the amount of public misery. If, together with these, Rome could have offered to her conquerors an enlarged knowledge of nature and of the useful arts, and clear views of the principles of political economy, and the higher science of legislation in general, we need not doubt that they would have accepted these gifts also, and that thus the corruption to which her law and religion were exposed, would have been in a great measure obviated. For it is a most important truth, and one which requires at this day to be most earnestly enforced, that it is by the study of facts, whether relating to nature or to man, and not by any pretended cultivation of the mind by poetry, oratory, and moral or critical dissertations, that the understandings of mankind in general will be most improved, and their views of things rendered most accurate. And the reason of this is, that every man has a fondness for knowledge of some kind; and by acquainting himself with those facts or truths which are most suited to his taste, he finds himself gaining something, the value of which he can appreciate, and in the pursuit of which, therefore, all his natural faculties will be best developed. From

the mass of varied knowledge thus possessed by the several members of the community, arises the great characteristic of a really enlightened age, a sound and sensible judgment; a quality which can only be formed by the habit of regarding things in different lights, as they appear to intelligent men of different pursuits and in different classes of society, and by thus correcting the limited notions to which the greatest minds are liable, when left to indulge without a corrective in their own peculiar train of opinions. Want of judgment, therefore, is the prevailing defect in all periods of imperfect civilization, and in those wherein the showy branches of literature have been forced by patronage, while the more beneficial parts of knowledge have been neglected. Nor is it to the purpose to say, that the study of facts is of no benefit, unless we form from them some general conclusions. The disease of the human mind is impatiently to anticipate conclusions, so little danger is there that it will be slow in deducing them when it is once in possession of premises from which they may justly be derived. But, on the other hand, wherever words and striking images are mainly studied, as was the case in ancient Rome, man's natural indolence is encouraged, and he proceeds at once to reason without taking the trouble of providing himself with the necessary materials. Eloquence, indeed, and great natural ability may, in the most favorable instances, disguise to the vulgar the shallowness which lurks beneath them; but with the mass of mankind this system is altogether fatal. Learning, in the only shape in which it presents itself to their eyes, is to them utterly useless; they have no desire to pursue it, and if they had such, their pursuit would be fruitless. They remain therefore in their natural ignorance; not partaking in the pretended cultivation of their age, and feeling no deprivation when the ill-rooted literature, which was the mere amusement of the great and wealthy, is swept away by the first considerable revolution in the state of society." pp. 539 – 542.

As a specimen of Merivale's skill and grace in character-painting, we borrow his portrait of M. Porcius Cato.

"The name of M. Porcius Cato has already been introduced as a leader of the aristocratic party. Younger by a few years than any of his political rivals, he entered upon the stage of public life at a somewhat later period. The absence of Pompeius in Asia first made room for him in the councils of the nobility, whose cause, though himself a plebeian, (one, however, of most ancient and honorable descent,) he embraced with more thorough and exclusive devotion than any of his contemporaries. His character was rigid and untractable, and marked a reaction from that laxity of manners and principles which the circumstances of

the time had rendered general, and which unfortunately seemed indispensable for efficient political action. Well read in books, his mind had no power to assimilate the lessons of history; a systematic follower of the Stoic philosophy, the genuine springs of human action were unknown to or disregarded by him. He idolized the name of his great-grandfather, Cato the Censor; and while he studiously formed himself upon that ancestral model, he had, in fact, already inherited a kindred disposition. But the Censor lived at a time when public opinion still respected the principles at least of old Roman austerity. It was a minority of the extravagant and the speculative, the innovators in practice and theory, against whom he contended; and unsuccessful as he was, he still preserved the reverence of the people, and bequeathed them an honored name for the admiration of posterity. The younger Cato applied the same rules and maxims to his own times, which were rapidly becoming obsolete above a century before. The poet of the civil wars compares Pompeius to the venerable oak, majestic in its decay, and honored for its antique associations; Cæsar to the lightning of Jupiter, which spares nothing venerable, nothing holy, neither the monarch of the forest nor the temples of its own divinity; Cato he might have likened to the rocky promontory which marks the ancient limits of an encroaching ocean, still resisting the action under which the neighboring cliffs have mouldered away, and barely attached to the continent by a narrow and diminishing isthmus. Yet even the iron disposition of the Stoic was not unaffected by the change of circumstances since the period which he most admired. The same temper which made the elder Cato a severe master, a frugal housekeeper, the cultivator of his own acres, the man of maxims and proverbs, converted the younger into a pedantic politician and a scholastic formalist. Private life had become absorbed in the sphere of public occupations; the homely experience of the individual was lost in the recorded wisdom of professional philosophers. The character of the Censor had been simple and true to nature; that of his descendant was a system of elaborate though unconscious affectations. Vol. i. pp. 90, 91.

The two works before us cover in part the same portion of time. The volume of Arnold contains all his historical contributions to the Encyclopædia Metropolitana, the contents of which are sufficiently described in the title. Merivale's second volume terminates with the death of Julius Cæsar, — a length of prelude big with magnificent promise for the voluminousness of the entire work.

The leading questions which have presented themselves to

our thought in reading these books, concern the motives and principles of Julius Cæsar. Was he a mere soldier of fortune, or a sincere lover of his country? Was he the subverter of Roman liberty, or the defender and conservator of whatever of ancient Rome had survived the discord, faction, and corruption of his own and preceding times? Is he to be condemned as a usurper and a tyrant, or to be revered as a patriot? It seems to us that historians in general evade these questions, or rather give them a double answer, which is the least probable solution of all; for a man of his decision, prowess, energy, and cogency cannot have been the mere slave of circumstances, but must have had definite aims, and must have regarded himself as occupying a definite position with reference to the past and the future of his country.

His moral character should first be taken into the account in judging of his purposes. We are strongly inclined to regard him as a man of superior excellence, when tried by the gross and defective standards of his day. He was indeed stained by faults, which would be incompatible with pure patriotism in our own times; for we dissent from those, who can conceive of personal immorality and public virtue as coexistent in modern Christendom. Whenever, under the light of Christianity, we see a man reckless of pecuniary obligations, false in his domestic relations, the unresisting victim of passion, appetite, or lust, however profound his political wisdom, however splendid his services, we have no faith in his disinterestedness, — we suppose him only judiciously selfish, — we impute to him a higher regard for official honor and gain than for the interests of his country, — we are prepared to see him, even at the last moment, play the demagogue, the turncoat, or the traitor, if he can thus best subserve his own private ends. But Cæsar can be amenable to no such severe standard. His faults were venial in his position. In his youthful prodigality, and under a vast load of debt, he seems only to have been drawing on future fortunes, for which his reckless expenditures were essential in paving the way. Nor, with the immense revenues of provincial offices, the chances of success in legacy-hunting, and the large emoluments accruing from judicial or political services to individuals, could the creditors of an eloquent and ambitious youth have imagined that they were incurring any risk beyond that of his premature

removal by death. But when Cæsar could command unlimited resources, he was equally free from the charge of ingratitude to his friends and of rapacity towards his enemies. With what were deemed the legitimate spoils of war he gladly rewarded his early adherents and helpers; while, by protecting the private property even of his well-known enemies, he alienated not a few of his mercenary and unscrupulous partisans.

That Cæsar was addicted to debauchery constitutes the greatest blemish upon his reputation. Yet it must be remembered that, on all subjects connected with the relation of the sexes, the Roman conscience was then utterly torpid; and the proof is wanting that Cæsar practised greater license than Cato tolerated, or was chargeable with any of those unnatural forms of guilt, which were not only shamelessly enacted by his pleasure-loving coevals, but unblushingly celebrated in poems that will last as long as the Roman name shall endure. In the indulgences of the table he was singularly temperate at an age when gluttony was the fashion of the aristocracy, and drunkenness little less than a duty to society. Cato, who hated him, was wont to say that he alone came sober to the enterprise of destroying the republic.

Nor yet can we impute the immense slaughter of Cæsar's wars to a settled ferocity or cruelty. The barbarians, whom he conquered in fair field, he deemed his lawful prey, and Rome was, in his view, only exercising her indefeasible rights in defending and enlarging her sphere of jurisdiction. He was never gratuitously sanguinary, nor can there be adduced a single instance of vindictiveness towards his personal enemies; while the progress and termination of the civil war were signalized by numerous acts of forbearance, forgiveness sometimes more than once or twice, and the magnanimous sacrifice of private retaliation for the public good. Most of the conspirators against his life were men whom, for the sake of the state, he had pardoned and raised to honor, while they could not forgive themselves for receiving office and emolument from one whom they regarded as a usurper.

That he was an unbeliever in the popular mythology was creditable to his good sense, and that he openly professed his unbelief only makes us think the better of his honesty. At the same time, there can be little doubt that he felt the reality

of a controlling power and Providence, and was under the dominion of what it is easy for us to brand as paltry superstition, but which, under pagan auspices, only demonstrated the indefeasible supremacy of the religious principle.

In the earlier administration of the province of Transalpine Gaul, we can trace no measures inconsistent with his loyalty to the republic. His aggressive wars were a part of the settled Roman policy; his conquests belonged to the scheme of progressive enlargement, which had been the prime aim of the commonwealth from the days of Romulus downward. The privileges which he ceded to allies, and his constant advocacy of the rights and immunities of the Italian cities, were the surest mode of perpetuating their allegiance, and securing their tranquillity in peace and their vigorous coöperation in war. In refusing to yield up his command at the bidding of the hostile oligarchy, he indeed virtually raised the standard of rebellion. But in this, he might have confidently appealed from the temporarily dominant faction to the collective interests of the empire. Had he obeyed, he must not only have submitted to disgrace, banishment, and confiscation, but he must have left his veterans unrewarded, yielded up his province to dismemberment, and abandoned his conquests to the chances of a weak administration, newly levied armies, and inexperienced commanders. He still governed in the name of the Roman people, and maintained the posture of one amenable to rightly constituted authorities and an impartial tribunal.

In the civil war, we cannot but regard him as the veritable representative and champion of the Roman people against a narrow, proscriptive, sanguinary aristocracy. Had Pompey been the victor, the senate would have been more than decimated by the executioner, and half the estates in Rome would have passed under the spear, or into the hands of the victorious faction; nor would republican forms have retained even the nominal reverence which Cæsar never denied them. The heart of the nation was with Cæsar in the conflict. His was the party of individual security, social order, and public justice. Pompey tolerated no neutrality, and the eager flocking of his partisans to his camp indicates the only terms of safety and amnesty which he was prepared to yield. The quietness with which the unarmed of both and all parties awaited

Cæsar's successive stages of conquest, and his approach to Rome, indicates universal confidence in his integrity and his clemency.

But, in assuming the place of an autocrat, though under republican names and with the show of popular election, he laid violent hands on the Roman constitution, annihilated the commonwealth, and became the first emperor without the title. The question then recurs, Had not republican Rome ceased to exist prior to his usurpation? To this there can be but one answer. Election by the people had become a farce and a fiction. There had never been devised any system, by which, after the city became populous, the suffrages of the citizens could be fairly collected. The centuries had grown more and more unequal in their numbers, and even the summoning of the poorest and fullest centuries, for the nominal exercise of their rights, was a rare event. The system, honestly carried out, may be understood by supposing the elections in Boston determined by the majority of streets, and the vote of the several streets taken in the order of the fewness and opulence of their inhabitants, — Beacon or Summer Street being called first, Broad or Belknap Street among the last. To make the parallel complete, we must suppose the citizens on the richer streets, so closely united, both by common interests and by hereditary contempt and hatred for the dwellers in plebeian quarters, as always to present a united front against the men or measures peculiarly favored by the many. In this case, the election would so generally be determined by the majority of the streets comprising a minority of the people, that it would be deemed a useless impertinence to call the poorer citizens off from their work, and to block up the passages to the hall of assembly, for the observance of an unmeaning formalism. But even this statement by no means fully represents the condition of things at the period of which we are writing. Cæsar had probably never known of an election effected, or a law enacted, except by means of bribery or violence. In fact, the consuls of the year were the men who, during the preceding year, had bought off, overbidden, falsely impeached, or covertly assassinated their nearest competitors. The centuries were packed for each election. The mercenary interposition of tribunes, or the unlimited authority of irresponsible augurs, could always be depended upon to dis-

solve or prorogue the *comitia*, if by any chance the aspects were unfavorable to the preconcerted movements of those who ruled the hour. Every powerful man in the state had a sufficiently numerous body of retainers, whether freedmen or clients, to impede the access to the polls of voters who might turn the fortune of the day. The consequence was, that the constitutional had become no less impotent than the actual majority of the citizens; and the supreme power of the republic was at the mercy of rival or successive cabals, all equally selfish, exacting, capricious, unprincipled, and incalculable.

Meanwhile, the judiciary power had become a mere nullity. Each verdict was determined by the superior audacity or the more profuse bribery of the magistrates, or of accuser or defendant, claimant or respondent. Sometimes armed men overawed the tribunal. Sometimes hired bullies and ruffians frightened the judges into submission. Still oftener, they took their seats with the sentence agreed upon and paid for; and not unfrequently the party, who thought his cause as sure as money could make it, found too late, to his double cost, that his opponent had outbribed him, and secured the very judge whose solemn pledge he had been purchasing at a ruinous sacrifice.

Now it requires no very strong effort of the imagination to suppose that Cæsar may have regarded this abounding profligacy, this virtual anarchy, as a justifying and worthy cause for armed interference, — that he deemed it the part of true patriotism to force back the reign of justice, equity, and order. Nothing sacred remained to be destroyed, — nothing, that in better days had been held inviolable, remained unviolated. He had been from youth the champion of popular rights, and had manifested no sympathy with any of the successive factions of merely senatorial or patrician partialities. On the other hand, he had never ceased to be the object of jealousy and aversion to those who identified the state with their own aristocratical clique. And when he entered upon his successive dictatorships, or suffered himself to assume the consular office for an extra-legal term, he can have had no room for doubt that the untrammelled suffrages of the Roman people would have placed him where he stood.

An alternative course, no doubt, suggested itself to Cæsar. He might have lent his force as a military commander, and

his influence as a citizen, to the reëstablishment of the ancient order of the republic. But in so doing, he would have rendered a great disservice to his country. The Roman constitution was adapted only to the government of a city of limited extent and few dependencies. Its inadequacy began to be felt so soon as intercourse, whether peaceful or hostile, was extended beyond the Italian peninsula. Nay, there were, not infrequently, domestic emergencies utterly beyond its control. The office of dictator was in no sense constitutional, but a time-honored mode of suspending all rights, obligations, and functions under the constitution, — a suit of storm-sails for the ship of state, to be used when the fair-weather canvas was close-reefed. As the empire grew by affiliation and conquest, unity, despatch, and continuity of administrative policy became more and more essential; and for lack of these elements, almost every inch of subject territory had to be conquered more than once, and the sovereign city itself was repeatedly on the brink of ruin. But unity there could not be, when the consuls were chosen with no reference to their common opinions or mutual adaptations, but, on the other hand, one was often thrown into the chair to secure the election of the other, or was placed there solely to neutralize his colleague. Despatch was also impossible; for that can be the result only of use and experience, and the consuls came generally to their office as absolute novices in the management of all civil functions, beyond the precincts of their own city, and yielded place to their successors before they had become conversant with the routine of official duty. Continuous, nay, even definite, policy was out of the question, for similar reasons; for the term of a single year was too brief for the development of any principles of government, or the establishment of any settled plan of administration. Meanwhile, the people had lost whatever national traits might once have fitted them for self-government. There was no estate on which reliance could be placed for integrity or patriotism. The senate was, in part, a haughty, luxurious, and effeminate oligarchy, — in part, a band of needy and profligate demagogues. The equites were proverbially mercenary, and every man among them was constantly on sale to the highest bidder. Of the plebeians, the richer emulated all patrician forms of vice, while the poorer were public paupers, depend-

ent on the public granaries and on the largesses of office-holders. At the same time, the empire, by its vast extent and its heterogeneous elements, had outgrown the possibilities of a purely republican administration. A vigorous central government, under the continuous control of a single mind, was the desideratum of the age, and alone could have preserved the integrity of the empire. Nor can we deem it inconsistent with the purest and most enlightened patriotism, that Cæsar should first have levied war against a faction avowedly hostile to all that he identified with the true interests of Rome, and then should have accepted whatever official trusts an admiring senate and a grateful people saw fit to devolve upon him. Nay, did not the very acts of senate and people, the almost unanimous acclamation of the citizens, the seeming acquiescence of his old political enemies, virtually modify the constitution to suit the exigencies of the times? For it must be remembered, that the Roman constitution was not a written document, with prescribed modes of amendment, but that it was, at every successive epoch, what the will of the senate and the people made it, the creature of their votes; and from the expulsion of Tarquin downwards, modified only by civil violence or by the simple immediate mandate of the legitimate assemblies.

Cæsar's use of the supreme power strongly confirms our view of his character. The conspirators against him deprived posterity of the opportunity of knowing whether he would have accepted the insignia of royalty, and whether he meditated the transmission of his honors to his nephew and heir. His consenting to wear the laurel crown should be regarded as a non-significant fact; for the laurel was at once the meed of his foreign victories, and a welcome covering for the baldness of which it was his infirmity to feel ashamed. Certain is it, that he solicited only republican names for his public functions, and that more pompous titles and environments might have been his for the asking, and were informally urged upon his acceptance. But that what we should now denominate a limited monarchy was his ideal of the government which he deemed best for Rome, and of which he determined to be the lifelong head, if not the founder of a dynasty, we cannot doubt. We accord, in the main, with the views expressed by Merivale, in the following passage.

"We have now followed the career of Julius Cæsar to the point at which his supremacy is finally established, and the proud defiance of a licentious oligarchy has subsided into the murmur of a broken and proscribed faction. We have seen him commence his political existence with the assertion of the popular claims identified with the hero of his own house. He urged them with a fearless vehemence, in which it is impossible to mistake the sincerity of his devotion. The first steps of every popular champion are bold and decided. At the outset he has a distinct object before him; he knows what his grievances are, if not their true remedies. He may delude himself, as he proceeds, with the fancy that he is reconstructing, but there is no deception about the fact that he is pulling down. His days and years are marked by the successive demolition of real and substantial things, while his new creations are, perhaps, no more than ideas. Such, however, was not the case with Cæsar. From the time, indeed, of his first entry into public life, his name had been signalized by the overthrow, one by one, of the strong-holds of ancient privilege, and in the ardor of the attack, straitened in his means and controlled in his natural impulses, he had little opportunity of applying himself to the task of renovation. Accordingly, when the ruins of the past began to be cleared away, he was astonished to behold how great was the gap he had made. The solemn question now urged itself upon him, how this desolate space was to be again filled up; and in the boldness and originality of his views, it found an appropriate solution. But the work to be performed was long, and the time granted to him was but short; we shall see him, however, erect more than one durable edifice of utility and justice, and bear witness to his planning of others on a scale still more magnificent, while many vast conceptions were obviously floating in his mind, of which he was not even permitted to shadow forth the outline. His undisputed tenure of power lasted hardly more than one year and a half, including an interval of ten months' absence from the city. It was, therefore, impossible that his ideas, however long he may have actually brooded over them, could receive their complete and methodical realization. We are the less able to appreciate, with accuracy, the clearness of Cæsar's views, and the process of their development, from the fact of there existing no record of the order in which his enactments succeeded one another. We know not at what stage his legislation was interrupted by his departure for Spain, nor have we the means of judging whether his reforms gained in boldness or lost in impartial justice, when his power seemed secured by his final victory. It would have been deeply interesting to have remarked how one idea may have germinated in many new directions; how various imperfect measures may have conduced to one harmonious result.

But the measures themselves, confused and disjointed as is the form in which they present themselves to us, point decisively to the existence, in their author's mind, of a comprehensive plan for the entire reconstruction of the national polity. The general principle which pervades them is the elevation of a middle class of citizens, to constitute the ultimate source of all political authority. The ostensible ruler of the state is to be in fact the creation of this body, its favorite, its patron, its legislator, and its captain. To this body he is to owe his political existence. He is to watch over the maintenance of an equilibrium of popular forces, checking with the same firm hand the discontent of the depressed nobility, and the encroachments of the aspiring rabble. The eternal principles of rule and order he is to assert as sacred and immutable; but he is to be himself responsible for their application at his own discretion to the varying wants of society. This idea of government was perfectly new to the ancient world. It was the first rude conception of popular monarchy, the phantom of philosophers and jurists, which has been so often shadowed forth in theory, but never permanently realized in practice. The event indeed proved that an attempt to combine the discordant elements of despotism and freedom could avail only as a temporary expedient, under favor of a strong popular reaction from a period of anarchy and suffering. It was repeated, as we shall see, under these conditions, with limited and transient success, by Augustus and Nerva. But its effect was either to exchange the sword of the open foe for the dagger of the assassin, or to crush all independence of thought and speech, and congeal in stagnant inaction the life-blood of the nation. If, however, it contained, in execution, the seeds of premature degeneracy and corruption, the humane experiment at least deserved, and did not fail to obtain, the sympathy of mankind.

"The pomp of four triumphs, the spectacles of the theatre and the circus, the unwonted splendor of the decorations lavished on the dictator's person, were merely frivolous expedients for amusing the people, and enhancing the popularity and dignity of their favorite. To consolidate the power he had acquired on the firm basis of the national affections was a much more arduous undertaking. The demands of the age, as they presented themselves to Cæsar's mind, may be summed up in the language of the discourse attributed, though with little authority, to the historian Sallust, but in which some later rhetorician appears at least to have embodied the sentiments ascribed to antiquity by his own contemporaries. A noble object of ambition, it was said, lay open to the imperator who should aspire to rule over the Roman people. He found them bloated and corrupted by the excess of luxury, overwhelmed with debt and degraded by the vices which

debt engenders. The nobles were selfish and cruel, and had sought in a civil war the surest refuge from their creditors, and the only means of retrieving their fortunes. But this faction had now been crushed; let the seeds of such passions be prevented from taking root again. Let luxury be repressed by sumptuary laws; let the numbers of the privileged orders be increased; let the rights of citizenship be extended; let colonies be planted in the provinces; let military service be required equally of all, and none be retained under their standards beyond a reasonable period. Let the magistrates and judges be chosen for their virtues and dignity, and not merely for their wealth. It would be vain to entrust the working of such reforms as these to a commonwealth of free and equal citizens; but the impartial eye of a supreme ruler may watch securely over their execution, and neither fear, nor favor, nor private interests interfere to clog their operation." Vol. II. pp. 401 – 406.

Such seem to have been the noble purposes with which Cæsar entered upon the virtual sovereignty of Rome; and, had they not been maturely formed and resolutely held in view, his brief rule could not have been so prolific as it was of wise, just, reformatory, and beneficent measures. Never, in any other instance, were the abuses and excesses consequent upon a civil war so diligently contended against and so effectually suppressed. The relation of debtor and creditor was placed upon a much more secure basis of equity than it had occupied for a score or two of the previous years. The disarmed soldiery were not only settled upon the public domains, but so widely scattered through Italy and the provinces as to preclude the combined action of any considerable number of them, whether for predatory or seditious purposes. The sickly and exhausted body politic was recruited by the ceding of the full rights of citizenship not only to the Italian cities, but to certain classes of the provincial subjects. While Cæsar thus sought to extend the franchise, which had been previously guarded with a narrow, paltry exclusiveness, he devised various measures for checking the dangerous increase of slaves, for encouraging emancipation and stimulating free labor. Of his sumptuary laws we can only say, that they were authorized by the best political philosophy of that age, and that their design was eminently worthy a paternal administration. While these enactments were adopted to counteract the most nearly imminent evils and perils, Cæsar

extended his views into the future, and projected a code of laws, under which all local immunities and burdens were to be merged in the impartial administration of justice throughout the empire. With similar purpose he instituted the thorough survey of every province, with reference to the formation of a complete map of the Roman world. His reform of the deranged and confused calendar, important in a scientific aspect, was hardly less so in its political bearings; as the indefinite Roman year had, like all things else, become venal, and subject to be lengthened or shortened by the application of bribery to the pontifical college. To him also belongs the honor of a pioneer in the diffusion of knowledge among the people, in the institution of the earliest free public library of which history bears the record. In fine, there was no department of the public service which escaped his providence, — no vital interest of the people which was not cherished under his guardianship.

His true magnanimity appears the more conspicuous, when we compare him with the most illustrious of his coevals. Cato was undoubtedly a severer moralist and a man of more rigid virtue; but he belonged to the past rather than to the present, and was too obstinate and impracticable to exert any appreciable influence on society or the state. The shadow of self lay constantly on Cicero's path, and his magnificent genius had its offset in an equally magnificent egotism. Even in his greatest achievements and most generous acts, he never loses sight of the necessity of defining his own vague and multiform position, while the self-consciousness of a *novus homo* made him equally jealous of the ancestral nobility, and ashamed to appear as the open advocate of the rights of the people. As for Cæsar's assassins, their dissimulation and treachery, their supple sycophancy, their ready reception of honor and emolument from the conqueror, and their ill-disguised mortification that his sense of their merits was not fully commensurate with their own, deprive them of such modicum of honor as may attach itself to the simple act of tyrannicide, and reconcile us to the retributive fortune which expiated blood by blood.

Lastly, when we compare Cæsar with his great rival, we are most of all made aware of his incontestable superiority. As a general, Pompey was unsurpassed in vigor, courage,

and efficiency on the field of battle; Cæsar, in the command of resources, the arrangement of campaigns, and the whole conduct of war. As a statesman, Pompey had the narrowness of a Roman aristocrat; Cæsar, the large heart and generous aim of a citizen of the world. Pompey would have sacrificed half the empire for his friends, and the other half in vengeance upon his enemies. Cæsar's friends were all who were not his enemies in arms; his only enemies were those of the people and the state. Pompey would have seemed less great, had he lived to enter Rome with laurels from Pharsalia; Cæsar's brief political career eclipses his renown in arms.

We trust that we shall not incur the charge of anti-republican tendencies in our vindication of Cæsar's fame. On the contrary it has been our incidental aim to indicate the only principles on which free institutions can be maintained. If officers become venal; if elections are given over to irresponsible wire-pullers; if the ermine of justice is thrown into the scramble of the caucus and the ballot-box; if ignorance is fostered or tolerated; if social distinctions are aggravated; if, under the specious names of free trade and reciprocity, American labor is forced into beggarly competition with pauper labor abroad; if the nation is broken up into a multitude of selfish and short-sighted factions; if man-worship stands in the stead of right and principle, — our confederation must follow in the wake of the ancient republics. A nation must either be fit to govern itself, or must have a master. When a hydra-headed despotism or a single tyrant presents itself as the only alternative in the darker horoscope which abounding discord, corruption, and profligacy sometimes constrain us to draw for our country, we cannot but choose the former, and could only beg of an outraged Heaven to send her no less beneficent a tyrant than Julius Cæsar.

ART. VIII.—*Outlines of a System of Mechanical Philosophy, being a Research into the Laws of Force.* By SAMUEL ELLIOTT COUES. Boston: Little & Brown. 1851. 12mo. pp. 330.

IF a teacher, or a professed student, of the science of mechanics, or even a person who has the ordinary knowledge of this science which every educated man is supposed to possess, were told that this very original and striking book contained an elaborate attempt to disprove the Newtonian doctrine of gravitation, and to show that all the explanations which it offers of the phenomena of the physical universe are unsatisfactory and unsound, he would be likely to throw aside the volume unread, and with an exclamation of impatience at the perverted ingenuity manifested by sciolists in assailing the fundamental truths of science, which have been a thousand times so fully demonstrated, that reasoning against them could only proceed from ignorance or a morbid love of sophistry and skepticism. Yet we believe that his determination would be a hasty and injudicious one, not merely because it would deprive him of the pleasure he might receive from a highly entertaining book, not less remarkable for its literary merits than for the novel and comprehensive views which it presents of the phenomena of nature, but because it was probably dictated by an imperfect and unphilosophical conception of the true character of Newton's doctrine, of the aid which it renders to mathematical calculation, and of the sort of explanation which it affords of the wonders of the outward universe. The usefulness of the Newtonian theory, considered simply as a theory, or as a means of grouping physical facts together and viewing them as a whole, and of applying numerical calculation to them, is entirely independent of its truth when considered as an exact explanation of the *cause* of the phenomena. If this theory should be finally disproved, by discovering an incongruous fact or devising a crucial experiment, it would remain, in reference to all the phenomena to which it is now applied, just as useful and trustworthy a means of computation as ever; it would enable us to predict with equal certainty and precision the eclipses and other occultations, the paths of the comets and their periods of re-

turn, and all other recurring phenomena of the heavens. It would retain this valuable property, because, as an organon or method of inquiry, its function is only to bring together, and to enable us to deduce from one principle, the observed facts which are the real basis of prediction, or data from which the calculation is made.

Kepler's laws are the largest generalization that has been formed of observed facts in astronomical science; and these laws, when first made known, were strictly empirical, having been discovered by sifting the facts, and ascertaining that they could be distributed into a few classes, according to their obvious analogies and relations. The correctness of these laws, consequently, can never be impeached; they represent correctly the facts of observation, and are properly nothing but an abridged statement of these facts. Newton's theory of gravity carries the generalization one step farther; it brings together Kepler's three laws, and one other general fact of observation, or empirical law, — namely, the manner in which a stone thrown by the hand ultimately comes to the ground,— by deducing all four of them from one supposed or imaginary principle; that is, from the *hypothesis*, that all aggregations of matter attract each other in the direct ratio of their masses, and the inverse ratio of the squares of their distances. Newton's theory, then, is not an empirical law, but a hypothetical or imaginary one. He does not say that this attractive force exists, but only that all bodies move or rest *as if* it existed. His hypothesis, in regard to the solar system, amounts to the same thing as if he had imagined, that all the planets are bound to the sun and to each other, and all satellites to their primaries, by elastic, material ties, the strength of which varies directly as the masses of the bodies which they connect, and inversely according to the squares of their own length.

But the theory of gravitation alone is not enough to explain the phenomena. We must also *suppose* that a heavenly body, — the moon, for instance, — was originally launched in space with a projectile force sufficient to carry it entirely round its primary before the attraction of gravity could bring it down into contact with that primary; and, also, that the motion thus communicated, or any motion proceeding from a single impulse, will be prolonged in a straight line, with a uniform velocity, forever. With these three convenient

mathematical fictions, we can construct a system which shall embrace the mechanism of the heavens, and furnish inferences that will explain, more or less perfectly, many facts of observation on the surface of our own planet. In what light Newton himself regarded the chief of these hypotheses appears clearly enough from the letter to Dr. Bentley, in which he says, "that gravity should be innate, inherent, and essential to matter, so that one body may act upon another at a distance, through a vacuum, without the mediation of any thing else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity, that I believe no man, who has in philosophical matters a competent faculty of thinking, can ever fall into it." This language is not too strong, for the truth of the hypothesis is literally inconceivable. Brute matter cannot act where it is not; for action is a mode of being, so that to say, 'a body can *act* where it is not,' is equivalent to saying that 'a body can *be* where it is not.' How, then, can the sun act upon our earth, which is 95,000,000 of miles distant from it? Newton meant only that the earth revolves round the sun *as if* attracted by it, or bound to it by an elastic, material tie, under the conditions specified.

The postulate, moreover, that the natural path of motion is a straight line, is not supported by experience, and not susceptible of proof. Nearly all the natural motions with which we are acquainted are curvilinear; even the stone which flies from the sling enters immediately upon the curved path which brings it ultimately to the ground. If a planet, in like manner, were suddenly released from its centripetal force, we have no *proof* but what is derived from the *postulates* of the Newtonian system, that it would fly off in a straight line rather than assume a new orbit of revolution. The ancients believed natural motion to be curvilinear; the moderns have reversed this doctrine, simply because another of their assumptions — that all bodies attract each other — rendered this second postulate necessary. As was remarked on another occasion, "Newton found that the elliptical motions of the planets could not be mathematically represented by the hypothesis of one mechanical force operating on them constantly and uniformly; and so he *imagined* two forces, one being that of gravitation, which tends constantly towards

the sun, and another by which they tend to fly off at a tangent from their orbits; or the latter may be considered as the result of the primitive projectile force with which the planets were originally launched in space. From these convenient fictions, he found he could deduce, mathematically, their true motions. It is possible, though certainly not probable, that some mathematical theory will hereafter be invented, which will account for the motions of the system on the hypothesis of a single force; if so, it will immediately take the place of the present theory, on account, not of its superior truth, but of its greater simplicity."

And this is precisely what Mr. Coues has attempted to accomplish in the work before us.

"The law of gravitation," he says, "is not needed for the motion of the heavenly bodies. There is more truth to nature, there is more simplicity and beauty, in the idea that the force of the revolving body is within itself; that its curvilinear motion is its natural motion; that it goes round in its orbit without needing the guidance and direction of central and tangential forces; that it can be trusted to the unerring energy imparted to it from the beginning. It needs no great presumption thus to affirm; for by ancient philosophers, and in more recent times by Copernicus, Galileo, Kepler, Des Cartes, it was believed that circular motion was the natural motion." p. 81.

The undertaking of Mr. Coues is, therefore, a daring, perhaps even a presumptuous, one; but it is not to be immediately dismissed merely because it conflicts with the Newtonian theory, which has a great body of mathematical evidence in its favor, and has so preoccupied the ground that there is no room for a rival hypothesis. It is to be tried on its own merits, quite irrespective of the brilliant conformity of astronomical calculations with the observed results, which, in common minds, is the great support of the Newtonian system. Strictly speaking, mathematical science can offer no proof whatever of a physical fact; it can prove nothing but abstract propositions. When applied in the mixed sciences, it simply enables us to make a more strict and exact comparison than would otherwise be possible of the results of theory with the facts of nature. The only test of any hypothesis respecting the true cause of certain phenomena is observation and experiment; and a competent knowledge of

mathematics will enable us to apply this test with the utmost precision. With it, we can calculate, to a hair's breadth, the necessary results according to theory; and then, with the immense improvements of modern times in the instruments of observation, we can determine with equal accuracy the character and limits of the phenomenon. The astronomer, in his observatory, can determine the time at which the occultation *did* take place, within the tenth part of a second; and the mathematician, in the room below, can fix the time when, according to theory, it *ought* to take place, within the hundredth part of a second. The nice coincidence thus made out affects us with wonder, and seems to common minds a mathematical, and therefore incontrovertible, proof of the truth of the theory. But the coincidence itself can be made out, in a rough way, with the naked eye as the only means of observation, and by a train of reasoning from the theory so consequent and direct, that a mind of great analytical power could follow it without the use of one mathematical symbol. And the coincidence itself, whether roughly or nicely determined, affords just as much proof of the theory as would be gained in favor of any hypothesis as to the manner in which my neighbor's house caught fire, by showing, experimentally, that another house might be so fired under precisely similar circumstances.

The presumption in favor of the Newtonian system, which leads us to regard with so much suspicion and dislike any new theory that is devised to take its place, is founded, not so much on the nice coincidence between prediction and observation in astronomy, as on the great multitude of physical phenomena on the surface of our earth, of which the system offers an intelligible and satisfactory explanation. That the theory tallies with fact in relation to the motions of the heavenly bodies is a consideration which loses much of its importance when we remember, that such masses or densities must first be assigned to these bodies as will suit the theory; that the masses thus assigned cannot be directly verified; and thus, having formed what is in part a hypothetical conception of the solar system, we find that this system in all its parts will square with our hypothesis. As Mr. Whewell says, "the form in which the question of the truth of the doctrine of universal gravitation now offers itself to the mind of astro-

nomers is this: that it is taken for granted that it will account for the motion of the heavenly bodies; and the question is, with what supposed masses it will give the best account." The density which we are thus obliged to assign to the planets varies by no regular law, but seems to be distributed fortuitously. Mercury is more than three times as dense as the earth; Venus and Mars are both somewhat less dense than the earth, which lies between them. Jupiter has less than one fourth of the density of the earth; Saturn is but little more than half as dense as Jupiter, while Uranus is a little more dense than Jupiter. There is no uniformity apparent here; and accordingly, we are not surprised to learn that the calculations recently showed the law of Jupiter's attraction upon the asteroids to be somewhat different from what it is upon his own satellites; — a difficulty which was met by a new determination of the mass of Jupiter by Mr. Airy. As the density of the attracting bodies is always one element in the calculation, we may say that the only verification of the Newtonian theory which is afforded by astronomical science depends upon the previous assumption that this theory is correct. We do not say that the argument, even thus understood, has no validity whatever. The density which is necessarily assumed the first time the planet's attractive power is calculated, is found — perhaps with some trouble and after numerous corrections in the process — to answer for other cases, perfectly distinct from the former one; in other words, the determination of the mass from its action on the nearest planet is found to agree very well with its determination from the action of the planet upon its own satellites. Such coincidences, which are neither very numerous nor very exact, form about the only argument which can be gleaned from the computations of the astronomer for the truth of the theory of gravitation.

The theory, as we have intimated, is far more securely buttressed by the many plausible explanations, which have been deduced from it, of perpetually recurring phenomena upon the surface of our own planet, where, the substances exhibiting the phenomena being generally within our reach and control, experiment can be added to observation as a means of research. Here, also, the facts must sometimes be modified to suit the theory, the truth of the latter being pre-

viously assumed. Thus, in order to determine the density of the earth, Dr. Maskelyne made a series of experiments from which it appeared, that the mountain Shehallien in Scotland causes a lateral deflection of the plumb-line which is hung near its base, amounting to nearly six seconds. But M. Bouguer found that Chimborazo, a mountain vastly larger than Shehallien, produced a deflection of less than eight seconds. This being much less than what theory required, the difficulty was got over by supposing Chimborazo to be hollow from the effects of volcanic action. In the celebrated Cavendish experiment, recently repeated by Mr. Baily, the attraction of two large masses of lead for two light balls of different substances was rigidly determined through the delicate torsion balance, and the density of the earth thus ascertained agrees very well with the result of Dr. Maskelyne's experiment. Mr. Coues, we may remark in passing, does not notice the Cavendish experiment, the inference from which seems to be irreconcilable with the truth of his hypothesis.

Generally, however, a great number of facts and experiments, which do not need to have Chimborazan difficulties sifted out of them by conjectures that cannot be verified, are detailed in the common treatises on mechanics, the explanation of which upon the principles of the theory of gravitation appears very simple and plausible. So far as the reasoning which connects them with these principles is sound, they are coincidences of fact with theory. The argument for the truth of a theory, which is afforded by such coincidences, is not irrefragable; a rival theory may be propounded, which shall also account for the facts, and in a manner still more simple and satisfactory. But the argument is strong; the probability created by it, in this instance, is very great. The Newtonian system has occupied the ground for a hundred and fifty years, during which the spirit of inquiry, and even of skepticism, has been rife; and it has never been seriously shaken. A vast multitude of phenomena have been explained in accordance with its principles, and distributed in conformity with its laws. One difficulty after another in the way of its application to nature has been removed by the patient assiduity of scientific calculation and research, and by the vast improvements which have been effected in the modes of observation. The *probability* in its favor, we say, is very great;

but there is still a double *possibility* of error. The reasoning which deduces the facts from the theory may be shown to be unsound; or, if this cannot be done, another hypothesis may be started, which shall explain the facts equally well, or better. The logician, who has repeatedly tested every link in the chain of ratiocination, may laugh at the former possibility; but he cannot peremptorily rule the other out of court without examination. He is bound to give a reason for the ancient faith to which he adheres, by demonstrating the insufficiency of the novel explanations that are offered.

Our readers must not suspect us of an intention to emulate the daring of Mr. Coues, by openly assailing the Newtonian doctrine of gravitation, and offering another hypothesis to take its place. We have simply endeavored, with a primary reference to the logic of the physical sciences, to indicate the point of view from which such an attempt should be judged, and the nature of the prejudice by which, if such an hypothesis ever should be admitted to dethrone its rival, its early reception would certainly be obstructed. We have sometimes suspected, that there is a *vis inertiæ* in the minds of scientific men, as well as in brute matter. It is very difficult to start them from a position they have long occupied; but when once in motion, they roll on without much impediment, and often with an accelerated velocity. With regard to the performance of Mr. Coues, which has suggested these remarks, we can only say, that it is a work from which any reader may derive much entertainment and instruction, whatever opinion he may ultimately form as to the truth of the system of mechanical philosophy which it expounds and advocates. In the attractive qualities of its style, in descriptive power, in the skill with which the novel doctrine is propounded, and in the ingenuity and richness of the illustrations that are heaped around it, we have been often reminded of that noteworthy and notorious book, "The Vestiges of Creation;" though in sentiment and the tendency of doctrine, so far as religious belief is concerned, no two works could be more widely contrasted. In regard to the truth and sufficiency of this new theory, we have not formed any opinion, simply because the whole of the evidence on which it rests is not yet presented. The author of it observes in his preface, that "this work is not intended as an elaborate, phi-

losophical treatise, but as a rapid outline; and only those considerations are presented, which are necessary to develop the opinions advanced. Much collected material has been laid aside for future use, if it be thought that the opinions set forth are worthy of additional attention." We regard the work, therefore, merely as an ingenious speculation, which has led the maker of it to subject to a severe scrutiny some of the received Newtonian explanations of physical phenomena, with a view to test their soundness and to offer a new mode of accounting for the facts upon the principles of his own system. It is obvious that he may have had some success in the former part of his undertaking, though his own theory should appear on examination to be open to objections equally formidable. Some of his criticisms upon the received doctrines of mechanical science seem to us to have great weight; others are less important, or may be obviated altogether by trifling corrections of language.

The leading thought of the new system is clearly indicated in the sentence which stands as the motto on the title-page: — "That which we call gravitation, and fancy ultimate, is but one fork of a mightier stream, for which, as yet, we have no name." The doctrine of the identity of force, which is a capital feature of the work, is not, strictly speaking, a novel speculation; it has often exercised the minds of philosophers, both at an early stage in the history of science, and in our own day. But the manner in which it is here developed and applied is entirely original. We have no idea of force in the outward world, except as the unknown cause of motion, or rather of change of state. The only possible definition of it is, that which induces such change; and, consequently, that form of philosophy is most simple and intelligible, most in harmony with what we know of the general character of God's works, which traces all change, all motion, to *one* force or unknown cause, operating uniformly, or under general laws. Take away the supposition that the natural path of motion is a straight line, admit that it is curvilinear, and there is no further necessity for imagining an attraction of gravitation to account for the revolution of the planets about the sun. We then have these orbs propelled by a single force, acting under the simple law discovered by Kepler; namely, their velocities are such that the line which

connects each with the body around which it revolves, describes equal areas in equal times. The revolution of a planet round the sun is accompanied by rotation on its own axis, every atom in the system having two motions, orbital and rotary. Are these two motions subject to the same law, so that we can imagine them to be produced by a single force? At first sight, the two movements seem to have an opposite character. In rotation, the velocity diminishes as we go from the circumference to the centre; the axis is stationary, while the velocity of the surface, at the equator, is more than a thousand miles an hour. But in revolving round the primary body, the velocity increases as we go towards the centre. Still, the ratio of diminution in the former case is the same as the ratio of increase in the latter; we have the same law, as it were, exhibited under its opposite phases.

"From the nature of the rotating sphere there is one fixed ratio of increase of the velocity of its parts. Given the velocity at any distance from the centre of rotation, the velocity at any other distance can be determined. Its ratio of increase is proportional to the increase of the area of the circle described. We have the same measure of increase outward in rotation, that we have inward in revolution. The primary and secondary movements are under the same general law. Besides, there is also a fixed ratio between the velocities of both movements, for such is the far-pervading law of nature.

"If the orbit of any planet were enlarged without additional force of propulsion, it would move, in its new orbit, with decreased velocity. Its motion would not be harmonic; it would not describe the equal area of planetary motion. To bring it into harmonic motion it would require additional force, and this additional force needed would be measurable by the increased area of orbit. If, on the other hand, the orbit of any planet were decreased, with the same propelling force, its velocity would be increased, and it would be out of harmony with its associated worlds. With equal velocity it must part with, or transfer, a portion of its force. This degree of spare force would also be measurable by the reduction of the area of the orbit. The degree of force required or imparted is not measured by the increase or diminution of the circumference. The orbit does not measure velocity. It is a path of motion, continuous, without beginning or end. By a fixed law, the required force is determined by the area described, which increases and diminishes in a higher ratio than the length of the circumference which en-

closes the area. Thus, by the enlargement of a planet's orbit, it would need added force to preserve the harmony of planetary motion, and by its diminution it would impart force, and the force added, or given up, would be measurable by the change of area. In the words of Herschel: — 'The law of the areas determines the actual velocity of the revolving body at every point, or the space really run over by it in any given portion of time.' If the velocity be thus determined, so is the present force which determines the velocity.

"This is equally true of the velocity and force of rotation. If a mass at the surface of the earth be elevated, it gains thereby a superior level of rotation; its orbit is enlarged, — it requires additional force. If the mass fall, thereby decreasing its orbit of rotation, it has the spare force of descent; it requires less for rotation, and the falling body imparts force. The force received for elevation, the force given out by depression, is measured in one case by the increase, in the other by the decrease, of the area of the circle of rotation. Though in one view it appears as if there were the converse action of force, yet the general law is apparent, of the increase and diminution of required force for any area of orbit, whether acting outwardly from the centre, or inwardly to the centre, of revolution." pp. 19, 20.

Having attributed to one force all the motions which belong to the solar system, the author proceeds to inquire if all terrestrial motions and changes of state can be traced to the same cause, or brought under the same law. And first, with regard to the accelerated motion of falling bodies: —

"In the act of falling, whereby a lower level of rotation is assumed, force must be transferred from the falling body when its motion is suspended.

"The motion of falling is added to the rotary motion, thereby giving action to the present force. This motion being suspended, only rotary motion in a smaller orbit remaining, force will be transferred. Hence arises spare force of descent. The spare force of descent will be measured by the degree of descent. Hence the spare force of falling bodies is measured by the square of the time of descent, equal times giving equal distances of descent. Thus most distinctly is presented the law of falling bodies, or motion begetting motion, which, indistinctly understood, caused the great controversy between the schools of Des Cartes and Leibnitz, and which to this day has obscured mechanical science, by making the occasional abnormal motion of falling bodies the element of calculation of harmonic motion." p. 10.

The process of reasoning in the new theory, then, is the reverse of that which is followed under the Newtonian system. In the latter, the comparatively free and regular movement of the heavenly bodies in their annual orbits is deduced from the accelerated and inharmonic motion of bodies falling to the earth; in the former, "the abnormal motion is detected and measured by the normal, the motion of bodies in confined space being determined by the velocity of bodies in free space." To the obvious objection, that the spare force of descent is greater for an equal change of orbit at the equator than it is towards the poles, Mr. Coues answers, that a fall of one hundred feet at the equator changes the area of the orbit much less than an equal fall in a high latitude; "so that the increased ratio of the decrease of area compensates for the decreased force of rotation." Indeed, the spare force of descent slightly increases as we go from the equator, owing to the spheroidal form of the earth, which makes the decrease of area more rapid as the diameter of the orbit of rotation is diminished.

"There is not, then, one law of force for the revolution of the spheres, and another for their rotation, and another for the changes of level of the masses composing the spheres; and we think that we can show that the law, by which the spheres and masses are moved, also directs and governs the motion of the atoms composing every mass and sphere." p. 21.

Mr. Coues supposes that force is indestructible, and that it acts independently of direction; the phenomena which are usually referred to the law of action and reaction, he considers as indicating a simple transfer of force and a change in its direction. But as force does not always produce an apparent motion, he is obliged to suppose, that, besides the consentaneous motion of the atoms, or the progressive motion of the mass, there is an atomic or molecular motion of every atom composing the mass. Then, the transfer of force, which is not sufficient to move the whole mass, gives molecular or vibratory motion to the parts of the mass.

"Vibratory motion being the unequal or rather unconsentaneous motion of the parts of a mass, if there be not a gradual increment of motion from the surface to the centre, there will be nodes or points of rest. Thus musical chords manifest certain points of rest.

"Vibratory motion being determined by the degree of force, if the same quantity of matter be moved the same distance, the times of vibration will be the same; if the distance be diminished, there will be an increase of velocity. Tone being dependent on time of vibration, an increase or diminution of force changes the range, preserving the tone. Isochronous vibration is, therefore, a branch of the law which induces the same quantity of motion by the same quantity of force. It follows, too, that there can be no vibratory or reciprocal motion in free space." pp. 14, 15.

These principles, which, to avoid mistake, we have given mostly in the author's own language, are very simple and coherent; and if, as applied by rigid calculation to each case, they are found to describe the phenomena of nature exactly, the theory becomes exceedingly plausible. The mechanical principles of the Newtonian system are not applicable to the minute and insensible motions of the particles of matter, or to the phenomena of the imponderable agents, such as light, heat, electricity, and magnetism. We are obliged to learn a new philosophy here, and to study a whole set of novel forces, acting, for the most part, under peculiar laws. Mr. Coues, with characteristic boldness, stretches his generalization over the whole field, and undertakes to apply the principles, which he has derived from the operations of nature on the most extended scale, to the minute and intricate phenomena which are contemplated by the chemist and the electrician. He resolves all the subtle agencies which seem to constitute the *arcana* of Nature, and which, by their action on particles of insensible magnitude, produce marvellous and perplexing changes of form, into the single force which moves the spheres. But this portion of the work is less developed, the author's views being indicated only in a rapid outline, which is hardly distinct enough to show their peculiarities, or to afford material for estimating their correctness. We pass over them, therefore, in order to give our little remaining space to a consideration of the doctrines of the pendulum, the barometer, the pressure of fluids, the tides, and other phenomena, as they appear under the light reflected upon them by the two systems of mechanical philosophy which are here brought into comparison. The simple and concise statements of the book hardly admit of abridgment or of alteration, ex-

cept for the worse. We can follow the author but a little way, and that without much discussion, often adopting his phraseology, even when our limits will not allow us to copy the passage entire. The portions of the Newtonian philosophy to which he decidedly objects are briefly indicated as follows: —

"The errors of mechanical philosophy, if there are errors, arise from the assumption of gravitation, or the attractive power of matter; from the application of the law of the motion of falling bodies, to the uniform motion of bodies remaining in one determined orbit; from the belief that rectilinear motion is the natural motion, and that the curvilinear is a constrained motion, induced by conflicting forces; and from keeping out of sight the intense motion of every atom in its rotation and revolution with the earth, which, from its greater comparative velocity, supplies the governing or controlling motion, and by reference to which alone, incidental, retarded, or accelerated motion is to be understood or to be explained." p. 17.

What is usually called *momentum* is here explained to be "the degree of force present in action upon the body." It requires a greater force to move a large mass than a small one, so that the former imparts more force when its motion is arrested. Every atom in it needs its portion of force in order to be moved; and the velocity being the same, the total force is proportioned to the mass. But some time is needed for the communication of force to a mass, or, in other words, for the gradual induction of progressive and consentaneous motion through the diffusion of the force by atomic motion. Hence the slowly moving bullet will enter the water, while, if shot from a gun, it will be deflected. A column of water of the same diameter as the bullet must be pushed aside to make room for it, and time is needed for the induction of force enough into every particle of this water to give it the required motion. These simple principles seem to us to throw much light upon the *vexata questio* under the received philosophy, whether the force is proportional to the velocity, or to the square of the velocity. The same amount or energy of force may be diffused through a large mass moving slowly, as in a ship floating with the tide, or concentrated in a small mass moving swiftly, as in the bullet shot from a gun. We may need force for two purposes, — either for inducing molecular

or vibratory action in the particles of a body, as in cleaving a rock; or for inducing consentaneous and progressive motion, as by moving the rock onward. Time is needed for this latter object, in order that the force applied may have opportunity to diffuse itself among the atoms, and bring the whole bulk into forward motion; we apply the force through a large mass moving slowly, as by *prying* with a huge lever. For the former purpose, we explode gunpowder, which exerts its whole force instantaneously, or with a velocity which is immense in proportion to the mass. The received doctrine of *momentum*, then, which makes a large mass moving slowly the exact equivalent in respect to force of a small mass moving with a velocity proportionally greater, is practically untrue; and from overlooking the different occasions on which force is applied, the dispute about the relation of force to velocity has arisen.

Oscillation, or vibratory movement, Mr. Coues holds to be irreconcilable with the Newtonian theory, and to afford the strongest confirmation of the truth of his own hypothesis. "The swing of a pendulum, increasing in velocity in proportion to the decrease of distance from the centre of oscillation, the force of its motion being measurable by the area of the circle of which it describes a segment, shows that the nature of force is the same, however its energies may operate. It brings to mind the relative speed of the planets, increasing as the diameter of their orbits diminishes. Its regular beats mark time with the same precision as does the harmonic motion of the heavenly bodies." The weight of the mass moved and the length of the sweep do not change the time; give a stronger impulse, and the arc through which the vibration takes place is lengthened, but the movement is completed in the same time. The rise being equivalent to the fall, and seeming to be a continuation of that fall, — a continuation without break, — there is no apparent reason for attributing the force to a downward, rather than to an upward, attraction. Take away all impediments, let the pendulum swing in a vacuum without friction, and the vibrations will continue forever. The force of gravitation being constantly directed towards the centre of the earth, why should it not at last bring the vibrating mass to rest in the line which connects the centre of oscillation with the centre of the earth? The pertinency of this ques-

tion can be more clearly seen by taking another instance of vibration.

"In a scale-beam, balanced by two equal weights, how could oscillation take place under the law of gravitation? Yet, if you give one of these weights an impulse, they will oscillate, — oscillate forever in a vacuum without friction. Gravitation has no power to give alternate motion, — attracting both weights with equal force, it cannot first make one heavier and then the other. If both were held with equal strength, it would be absolutely impossible for this vibration to take place; there is an absence of all cause, or tendency, or capacity for oscillation. 'Vis inertiæ of motion' gives no aid; for the motion is suspended and renewed at every vibration. Nor does 'action and reaction;' for the difficulty is to account for the action. The earth might as reasonably be supposed to attract only one side of an evenly balanced wheel, and thus give it continuous rotation, as first to attract one weight and then another, when both weights are equally heavy. The motion is unquestionably from the transfer and retransfer of rotative force. The balance rotates as one mass with one degree of force, but this force flows from one part to the other of the mass.

"So far from being able to induce oscillation, the law of gravitation would immediately overcome the motion. The power of attraction, it is said, *in*creases with the decrease, and *de*creases with the increase of the distance from the centre of attraction. The weight going down is therefore more forcibly attracted, the weight going up is more feebly attracted, and this in an increasing ratio, both for the depression and for the elevation. The difference, it may be said, is so slight, that its results can never be detected by observation. But, slight as may be this want of equilibrium, it actually exists. Balances have been made so perfect and so nicely adjusted, as to turn by the impulse of the thousandth part of a grain. Suppose a perfect balance, without friction at the fulcrum, and acting in a vacuum. Here this want of equilibrium would be felt; the descending weight, being more attracted, could not rise; the ascending weight, less attracted, could not fall. There could be no oscillation under the law of gravitation." pp. 88, 89.

Some of the great waves, or "rollers," which rise occasionally in the southern ocean, show a vast disturbance of the equilibrium of nature. When millions of tons of water are thus heaped up in one volume above the ordinary level, the different action of gravity on the elevated and depressed portions must become sensible. The balance could not be restored; "it must be that the ascending water would continue to rise, and the valley of depression to sink lower." The

undulation of the water, on the new theory, is explained from the same principle as the oscillation of the pendulum; the impulse given by the wind, or by the finger in swaying the plumb-line from its perpendicular, calls out the force of rotation at different levels, a force which resides in the oscillating mass itself, and is not communicated to it from below. The length or sweep of the vibration is determined by the strength of the impulse; and the vibration is repeated, because the force liberated by the descent of one arm to a lower level of rotation raises the other arm to a higher level. The latter then descends, and the force might thus be transferred from side to side perpetually, if it were not gradually given off by friction and the attrition of the atmosphere.

"The motion of the wave is deeply interesting in all its aspects. The crests of the surge rise vertically, though they are apparently progressive. It is not until the water shoals toward the beach that they acquire a progressive motion, — progressive because near the shore there is not depth for the vertical movement. It requires double the generally supposed depth to form the vertical wave; for the uplifted water falls as much below the valley of depression as it rises above it. There is a descending wave, a current under water, which, as a wedge, forces up the succeeding wave, an opposite wave under the water. Hence on the shoaling water is the undertow, a retreat of the water at a certain depth with advancing water at the surface. The extent of this reciprocal wave is in exact proportion to the extent of the visible wave.

"Besides, the surface of the atmosphere is also to a degree in oscillation with the water over which it is spread. The wind conforms to the surface, it oscillates with the water; the sails of a boat, or the lower sails of a ship, are not becalmed with a steady wind, though surrounded by a wall of water. Says an experienced navigator, 'the lower sails in scudding are at times becalmed, from the rise of the stern of the ship, but never becalmed *on* the wind, though the waves rise higher than the sails, a fact which I have often tried to account for.' For this reason, — the undulating motion of the wind over the undulating surface of the sea, — is it that the wind off shore, not having acquired the corresponding undulation, however strong it may blow, smooths the sea.

"A most interesting scene was described by a friend, who stood on a small rocky island in the midst of the ocean, looking with intense delight on the forces of nature as displayed in a storm. The mountain waves were dark, almost black, the intensity of their gloom being heightened by the circle of white

foam which surged upon the rocks. A sudden veering of the wind, this wind being without the conforming undulation, prostrated the billows as it were at once; the ocean became as smooth as in a summer's breeze. There was no surge on the rock; but the surface of the sea was white with foam and curling in wreaths of vapor as far as the eye could reach. Gradually, however, the new wind acquired the sympathetic undulating movement, the waves again began to rise, and soon the surf dashed with its former fury against the island.

"Only because the rise and fall of the wave are from the reception and transfer of force, the mean level of the ocean ever remaining the same, could this result have been produced. If there had been 'accumulation of momentum to an enormous degree,' — if the attracting earth had drawn down the depressed waters with more strength than the elevated waters, — the ocean could never have been thus smoothed into the quiet of one level; the new wind would have increased the surging waves, so that they would have lifted their crests still higher in confused and broken masses, resulting in a conflict of motion which the strength of no vessel that ever floated could withstand." pp. 94–96.

If opposite winds meet, the force with which they were propelled is not destroyed by their collision, but receives a new direction, and thus creates that rotary movement of the air which constitutes a whirlwind. The force of the revolving wind is communicated to the surface of the earth beneath, and water or light bodies, having force thus imparted to them for rotation at a higher level, rise in the vortex. If a vessel be filled with water, and an orifice be then opened in the bottom to allow the water to escape, a vortex is formed in the vessel as the level of the fluid descends. The cause of this vortex is not very manifest upon the Newtonian theory, and various explanations of it have been given, none of which are satisfactory. Here is circular motion induced without a conflict of forces; for, according to the hypothesis, there is but one force present, that of gravitation, which acts directly downwards. We see this phenomenon most frequently in a tunnel, and it has been suggested that the vortex was formed by the conical shape of the tunnel; but this will not do, as the vortex may be formed in a vessel of any shape.

"The explanation of the fact is very simple on the principle which we present. The water issuing from the tube uses, in its downward motion, all the spare force of its own descent to a lower level. But the water remaining in the tunnel has also

descended to a lower level of rotation. It has therefore spare force, and this force has no other range than to confer circular motion to the water. The water therefore revolves. Thus is it, that facts, common, trivial facts, declare the general law." pp. 98, 99.

The only result to be expected from such a force as gravitation is described to be, according to our author, is, that it would draw the particles of matter more closely, and bind them more firmly, to each other. The consideration of it generally belongs to statics, not to dynamics. It is not even claimed, that it *gives* motion to the heavenly bodies; but only that it impresses upon this motion, which is due to the original impulse of projection, a peculiar character, continually bending its line of direction into a curve. So, also, upon the surface of the earth, a distinction is acknowledged between the weight of a body, or its tendency to fall, and its force of descent, which is proportioned to the time of the fall. According to the latter, it is difficult to account for the beginning of the fall, for until *some* time has elapsed, no force of descent is gathered; "when a body begins to fall from rest," says one author, "it begins to fall with *no* velocity." But according to the former, which is a constant tendency, and proportioned to the whole mass, when the support is withdrawn, the body should fall instantaneously with the entire force of its weight. Mr. Coues does not admit that there is any *weight*, properly so called, manifesting itself only as a *tendency* which never becomes a reality, or as a latent force which does not produce motion; for the only idea we have of force is, that it *does* produce motion, and we cannot recognize it in any other function. However frail the supports of a body may be, it will not crush them and fall until an impulse is given, a vibration induced, and some force consequently gathered by descent to a lower level of rotation.

"Practical men, who know only what they have seen, and believe in what takes place, without being troubled by theory, work on the faith that there is no force of gravitation in the mass which preserves one line of rotation. In taking away the foundation of a brick wall which had been undermined, to rebuild it, the owner expressed his fears that too much had been removed of the support at once, and that the building would fall. The reply of the mechanic was, 'I used to fear, but now I know that it is safe

until it *begins* to move, and I shall work without any jar; if it should begin to move, twice the present support would not keep it up.' In taking away the support of the arch of a stone bridge, after the keystone was put in, a slight, sudden sag of the bridge crushed the keystone, — a stone, the cohesion of which, if standing firm at one level, would have borne all the granite that could have been piled miles high upon it.

"This principle is evidenced by the superior security of the arch for bridges and similar structures. In the arch, there can be no descent without crushing the material of which it is formed. Thus, too, has the passing of a body of troops over a bridge, with measured step by beat of drum, often given the vibration which calls into action the weight or force of descent." pp. 107, 108.

Our author cannot admit, then, that there is any pressure of the atmosphere, or any increase of density in its lower strata proceeding from the weight of the superincumbent air. Each stratum, he argues, must have a force of rotation proportioned to its own level, and can impart force only by descent to a lower plane, where less rotary power is needed. Force is given out as it descends, additional force is needed to raise it to a higher level, where it will revolve in a larger orbit. But no force is present while it is stationary in altitude, except that which carries it round in its orbit with the earth; because no other force is manifested, and it is of the very nature — it is our idea — of force, that it must manifest itself by producing motion. The barometer, then, does not indicate altitude *indirectly*, by showing that the pressure of the atmosphere is diminished, a fact from which we infer greater elevation; but indicates it *directly*, by showing that the force of rotation is greater, just as a planet's diminished velocity indicates its greater distance from the sun. Mr. Coues argues that the increasing cold, as we ascend in the atmosphere, would condense the air as fast as the diminished weight would rarefy it; that the elasticity of the air, increasing with its density, would act against the rarer strata, and preserve the equilibrium of density; that, on account of the perfect intermobility of the particles of air, every wind that blows would tend to restore the equilibrium; and that the air, like other fluids, is supposed to press equally in all directions. Moreover, the atmosphere being a constant quantity, and thus regularly packed in horizontal layers of constantly increasing density, how can we account for the great variations in the

indications of the barometer at the same level and the same place, variations that have a range of about three inches? Mr. Coues accounts for them, on his own theory, by supposing that there are great oscillations, both periodic and occasional, of the surface or crust of the earth, — oscillations which, unlike the abnormal and obstructed ones called earthquakes, are noiseless, far-sweeping, and powerful in their operation, like the ground swell of the ocean. These oscillations produce the horary variations of the barometer, observed by Humboldt near the equator, which give two *maxima* and two *minima* every twenty-four hours; the regular recurrence of these phenomena, he says, being "undisturbed by storms, hurricanes, rain, and earthquakes," though the density of the atmosphere must be greatly affected by agencies so powerful. They produce also the greater, occasional variations of the barometer, which sometimes take place in a calm day with an equable temperature, when there is no indication of disturbance in the atmosphere. During the great earthquake at Lisbon, the mercury in the barometer sank, even in Great Britain, so as to disappear from that portion of the instrument which is usually left uncovered. There have also been observed, on our great lakes, sudden and great retrocessions of the waters at different periods, which were not accompanied by any remarkable phenomena in the atmosphere. Thus, in the summer of 1834, the waters suddenly receded from the outlet of Lake Superior at the Sault St. Marie, leaving the bed of the river, there nearly a mile wide, exposed for the greater part of its breadth, in which state it remained nearly an hour, when the waters came down again in a vast surge. A broad and silent undulation of the crust of the earth alone seems sufficient to explain such a phenomenon.

Returning to the subject of the barometer, the author argues that, even if the atmosphere were of varying density, the construction of the instrument is such that the barometer could not be affected by the variation, and the increase of density cannot be traced to gravitation.

"In the first place, when the barometer is constructed, the mercury in the tube does not owe its elevation to the pressure of the air. Let a tube closed at the top be immersed in mercury, and, when filled, let it be withdrawn upward by the hand; the

mercury is raised with the tube above the level of the mercury from which it is taken. The force required to lift it is just the weight of the mercury and tube together. The pressure of the atmosphere on the lower surface of mercury does not in the least degree aid in the elevation, does not diminish the weight; — because the sustaining mercury is pressed by the air, not one iota less of force is required to give the sustained mercury its elevation. The fact is admitted, and is accounted for in this manner: — 'The force used in lifting the mercury is needed to elevate the air over the tube; that being done by the applied force, it is the weight of the atmosphere which elevates the mercury in the tube.' But this reason is given without reflection; for the air is no heavier over the tube when the tube is filled with mercury, than when it is filled with water or air; yet the force applied measures the weight of the fluid within, and the contained weight does not increase or diminish the weight of the column of air over the tube. It is certain, therefore, that when the column of mercury is lifted with the tube, it is the applied force that lifts it, and not the weight of the atmosphere bearing on the surface of the mercury from which it is withdrawn. Of course, the weight of the atmosphere, not capable in the least of aiding the process of elevation, has no efficacy in sustaining the column when raised. One would almost suppose that an air-supported column of mercury would be like the air-supported balloon, and would not press with any weight upon the instrument." pp. 123, 124.

All are familiar with the experiment of filling a tumbler with water, pressing a thin paper, slightly moistened, over its mouth, and then carefully inverting it, when the water is sustained in the vessel, or kept from falling, solely, as it would seem, by the slight adhesion of the paper to the edges of the glass. The explanation usually offered is, that the pressure of the atmosphere against the paper sustains the water, which cannot fall except by leaving a vacuum in the upper part of the inverted tumbler. But the experiment succeeds equally well, if only two thirds or one half of the tumbler be filled with water; then, on inverting it, the space between the top of the water and the closed end of the glass is filled with air of the same density and elasticity as that which is outside. The upward and downward pressure on the water ought, therefore, to neutralize each other; yet the water remains suspended. Moreover, the *weight* which is sustained by the hand that holds the tumbler at a fixed level is equal

to the weight of the glass and the water taken together; how, then, can the weight of the latter be sustained exclusively by the pressure of the air from below?

"If it were possible that the sustained mercury under any circumstances could select a column of air of its own area, out of a volume of air pressing by elasticity in every direction, and disregard the pressure, weight, and elasticity of other columns which act on the surface of the cistern, yet it would be impossible as the barometer is usually constructed. The cistern is closed at top; its bottom is a piece of leather; the instrument is inclosed in a wooden case and suspended perhaps in a close room. It then receives the pressure or weight of its selected column of air forty-five miles high, one quarter of an inch in diameter, which may be twisted and beat about by the winds of heaven, and reaches the instrument through doors or windows, passing through the air in the room, which is subject to expansion and condensation by artificial changes of heat. Yet, not affected by these changes, it penetrates through the openings of the wooden case, acts on the bottom of the leathern support, and still gives exactly the degree of pressure belonging to its area, to the mercury in the tube through an aperture of any size! Is it possible that any thing can be measured by such an instrument, except, perhaps, the elasticity of the air in the apartment in which it stands, which would affect the whole extent of the surface of the mercury on which it acts?

"But if this last and only possible action of the air by its elasticity be the cause of the oscillation, why is it that two upper surfaces of mercury, one in the cistern and one in the tube, are an essential condition of the oscillation? A tube in a conoidal form with a piece of leather over its base, would as well indicate the pressure of the atmosphere. The leather would act as well thus placed. It would have the same elasticity. The air pressing on it would act as truly without an upper surface of mercury as with it. The fact that two upper surfaces of the fluid are necessary, abundantly proves that another cause for the action of the barometer is yet to be discovered." pp. 127, 128.

Thus far we have followed the reasoning of the author with little comment, our object being to give an exposition of his views, not our own mode of refuting them, especially as the former object alone would require more space than we can spare. But here we must say, that one of the objections to the received theory of the barometer, which is just intimated in the last extract, and which is expanded and strongly urged elsewhere, is not only fallacious, but is inconsistent

with another portion of the writer's own doctrine. Mr. Coues cannot see why, on the received theory, the column of mercury should be sustained only by a column of air of its own area, and should not feel the effect of the much larger column that rests on the whole surface of the mercury in the cistern; for he says truly, "it makes no difference in the action of the barometer whether the surface of the cistern is of two inches area, bearing a column of air of two inches area, or is an ocean of mercury, bearing the atmosphere of a hemisphere."

But, "fill a cylinder with mercury, and from the cylinder let a long tube ascend; subject the mercury in the cylinder to the pressure of a piston, and the rise of the mercury in this tube,—that is, the weight of the mercury supported by the pressure of the piston,—will be measured by the whole pressure of the piston, not by its pressure on a surface of mercury in the cylinder equal merely to the area of the tube in which the mercury is supported."

We doubt the fact. Suppose the cylinder to be ten square inches in area on a cross section, and the tube to be but one inch in area; then, if a piston nicely fitting the cylinder, and with an orifice in it to admit the tube to pass through, be pressed down upon the upper surface of the mercury with a force of one hundred pounds, only ten pounds of mercury will rise above the level of the piston into the tube, which we suppose to be open at the top. It must be so; ten pounds at a higher level in the narrow column balance one hundred pounds at a lower level in the wider column; for if the upper surface of the former descend ten inches, the upper surface of the latter will be raised but one inch. Mr. Coues himself recognizes this fact, and explains it, when treating of the hydrostatic paradox and the Bramah press. He says very truly, "the fact that the weight or pressure of one pound of water may be made to produce a pressure equal to that of a hundred or a thousand pounds, is in reality no more paradoxical than that one pound on the long arm of a lever should balance a greater weight on the short arm." Is it not evident that the same principle applies in the case of the barometer? If the mercury in the cistern present an area of upper surface ten times larger than that of the mercury in the tube, a descent of ten inches in the tube will

raise the surface in the cistern only one inch. Make the surface in the cistern ten times larger, and the same descent in the tube will raise this surface only one tenth of an inch; make the cistern as large as an ocean, (to adopt our author's illustration,) and this descent will raise the surface by a quantity almost infinitely small.

Mr. Coues forgets the hydrostatic paradox and his explanation of it, not only when treating of the barometer, but when he comes to speak of the buoyancy or floating of bodies. He explains the paradox, by saying that "the molecular force due to the greater depth of the long column is diffused through the less depth of the water in the cylinder; and being equally diffused through this body of water, its action is of course in proportion to the area of the water." But he afterwards says, "the force of molecular action will *not* account for the buoyancy or floating of bodies." He affirms, also, that buoyancy is not produced by the gravitating power, because "bodies will float in water of less weight than themselves." If one cup be placed inside of another, which is but little larger, so that their surfaces are nearly in contact, and water be then poured between them, the inner cup will be lifted, and will float, long before water enough is poured in to equal its own weight; and a ship placed in a repairing dock, which it very nearly fills, does not require water enough to equal its own weight before it will float. Very well; the tall and thin sheet of water between the cups, or between the sides of the dock and those of the ship, answers exactly to the long and slender column of water in the hydrostatic paradox and in Bramah's press; its pressure is multiplied as many times as the area, or cross section, of the floating part of the ship or inner cup exceeds in size the area of the thin sheet of water at the sides.

Mr. Coues farther objects, that the loss of weight by a submerged body, a loss equal to the weight of that volume of the fluid which it displaces, cannot be ascribed to the pressure of the fluid, because that pressure is equal in all directions,—upwards, downwards, and sidewise,—and these equal opposite pressures must cancel each other. He forgets that the upward and downward pressures are equal only when they are measured from one and the same point; and that the submerged body has bulk, which prevents these pressures

from being thus measured. The side pressures, being opposite and equal, do indeed cancel each other; but not so with the vertical pressures. Suppose the submerged body, a block of wood, is six inches thick, and that its upper surface is six inches below the surface of the water; then that upper surface is pressed *down* by a column of water of its own area *six* inches high, while the under surface of the block is pressed *up* by a column of water of the same area *twelve* inches high. Of course, the block must lose in weight a quantity just equal to the weight of the water which it displaces, or which is equal to its own bulk.

In speaking of the Magdeburg hemispheres, Mr. Coues seems to forget the very principle on which he here dwells at length, — that opposite pressures cancel each other. These hemispheres are two hollow half globes of metal, so fitted to each other that their lips, when touching, make an air-tight juncture. The air within can be exhausted by an air-pump, and the pressure of the external air then binds the hemispheres together with a force equal, as is usually said, to "as many times fifteen pounds as there are square inches *in the area of the mouth*, or at the surface of the division of the upper and lower hemispheres." Then the binding force, says Mr. Coues, cannot be the pressure of the atmosphere; for if so, "the external pressure would be in proportion to the surface exposed, — to the surface area of the sphere." Surely, the side pressures, being equal, must be borne by the strength of the metal, which prevents the sphere from being crushed in at the sides. Only that part of the atmospheric pressure can bind the half spheres together which operates perpendicularly against the area at the plane of junction. The shape of the instrument does not affect the result; two rectangular boxes of metal, each open only at one end, will answer as well as two hemispheres; and in the case of two such boxes, we can see clearly that the side pressures neutralize each other, so far as the adherence of the two halves to each other is concerned.

But the following objection to the received doctrine about the Magdeburg hemispheres is more acute, and less easy to be explained away: —

"It is said that, when these hemispheres were first exhibited, the inventor had a pair made of a foot in diameter, and that six

horses were unable to pull them asunder. Suppose the metal to be thicker, so that the vacuum would be only half the size. We know that much less force would be required to pull them apart, and yet the weight of the atmosphere around them would remain unchanged." p. 204.

We may ask further, — suppose the two hemispheres to be solid, or not hollowed at all; why should not the pressure of the atmosphere unite them just as strongly as if they enclosed a vacuum? Or suppose any two flat pieces of metal, with surfaces perfectly plane, so that, when united, no air could enter or remain between them; why does not the pressure of the atmosphere offer just as much resistance to the separation of these, as of the Magdeburg hemispheres?

We have not space to dwell upon the author's consideration of the theory of the tides, the trade winds, and many other phenomena, in relation to which we think he has been more successful than in treating of the pressure of fluids. Indeed, our limitation of room has caused us to do him serious injustice, even on those points which we have treated most at length; for to the reader who depends on our imperfect sketch alone, the doctrine will seem open to many serious objections, which he might find fully considered, and perhaps satisfactorily answered, in the work itself. We can, therefore, only commend the book strongly to lovers of science, as the production of a vigorous and original thinker, who is able to present his thoughts in perspicuous and graceful language, and to surround them with pertinent and attractive illustrations. They may not accept the conclusions of the writer; but they cannot fail to be pleased with the tendency of his doctrine, and with the manner in which it is developed and explained.

ART. IX. — *Richard Edney and the Governor's Family; a Rus-Urban Tale, Simple and Popular, yet Cultured and Noble, of Morals, Sentiment, and Life, practically treated and pleasantly illustrated; containing also Hints on being Good and doing Good.* By the Author of "Margaret" and "Philo." Boston: Phillips, Sampson & Co. 1850. 12mo. pp. 468.

WHAT genius without the rules of art can achieve, in any department, may be best seen by going back to the earliest specimens of pictorial art. We shall find in them a minute finish of parts, without regard to general effect; faces well chiselled, even to the smallest curl of the beard, looking at you with an expression of solemn repose that does not correspond with the ambulatory position of the legs and feet, which follow each other in profile through ignorance of the possibility of representing them in any other position by foreshortening. Perspective being not yet discovered, every group is flattened against the surface on which it is cast, the monarch in the same relief with the water-carrier, and on the same level, unless one of them, from economy of space, should happen to be suspended in mid air, or to stand on the other's head. The colors may remain fresh while the world stands; but they are laid on without shadow, and with no idea of the charm of harmony in variety, which painters of our day call *keeping*. When we see genius thus cramped by its very freedom from all rules, or bound down by superstition to the execution of prescribed anomalies, the petrifactions of old ideas, we almost doubt its existence. We feel the full value of those generally received principles of taste, which have been the slow growth of the culture of ages, and which rest on the general conviction, the *common sense* of mankind, and the everlasting truth of nature. Genius which spurns these trammels must still find itself judged by them. It must lose much, and, with the fastidious judge, all, of the homage which it feels to be its due.

The author of Richard Edney is certainly a genius, but unhappily, he is no artist. His work is full of errors any schoolboy of regular training would be able to correct. The title makes one think of a voluble book-pedler recommending

his wares. "Richard Edney, or the Governor's Family; a Rus-Urban Tale, Simple and Popular, yet Cultured and Noble, of Morals, Sentiment, and Life, practically treated, and pleasantly illustrated." We perceive that the writer must be an oddity; but as eccentricity is a frequent, though not a necessary, concomitant of genius, we go on, curious to see what sort of locality may be hinted at in the somewhat strangely constructed Latin adjective, and also to judge for ourselves of the appropriateness of the four English predicates. "Simple," it may be, in singleness of purpose; "popular," we hope it will be, in the sense of "universally read;" but we demur a little when it claims to be a "*cultured* tale." It seems more like a spontaneous and wildly luxuriant growth, wholly unpruned. As a critic, we look at it with admiring regret, just as a horticulturist might regard a vine, which, springing from a noble and vigorous root, has run wild, and stretched out long and awkward branches, overshadowing its fruit with the rank exuberance of its leaves.

The impression produced by the book as a whole is not a faint one; we feel that there is great power manifested, and long to see it more advantageously applied. There is much beauty, too; but our sense of it is weakened and disturbed by constant shocks and distractions, occasioned by prevalent bad taste in style, and by many dramatic absurdities. We cannot but wish some humble individual, gifted with a keen sense of the ridiculous and the incongruous, were admitted into the author's councils. A quick apprehension of the ridiculous is a very commonplace sort of instinct, far below the power of originating thought, or embodying it in nervous language; but genius, like that which appears in many passages of this author's works, might profit largely by the lessons which it is able to give, however distasteful at first might seem the suggestions of the teacher. The simple liberty of petition and remonstrance, which would detain a sentence or a chapter under protest long enough to afford time for impartial reconsideration, would, we are persuaded, finally have all necessary effect on the candid mind of the author of Margaret and Philo, and would not fail at last to convince him of sin against taste. He might smile at his friend's officiousness, and, as he looked down on him from his position of determined independence, laugh outright at his presumption; but once induced to dis-

trust his own taste, as biased by some mental idiosyncrasy, he would, as far as his own perception of the right did not interfere, trust to another's perception of the beautiful. There is a magnanimity in the character of Richard Edney, and a liberal tone infused into the whole work, running, perhaps, into an extreme in its disregard of factitious honor, that must, one would think, be the characteristic temper of the author's own mind; so that any one who should merely aim to show him a higher excellence, and a higher point on which to stand, while attempting to bring elevating Christian influences to bear upon society, would be secure of his hearty good-will.

If we are wrong in ascribing to him thus much of nobleness and manly good humor, we must still do our duty impartially, and uphold the authority, at least, of the most common rules of rhetoric. If no protest is entered against this motley style, this practice of introducing vulgar idioms and words coined at will into the "well of English undefiled" may find its imitators, who, like those of Carlyle, will perpetuate the eccentricities, with none of the excellences, of their model. The use of provincialisms, and the most homely colloquial diction, is not without precedent in the best writers of fiction. But they are used as characteristics of the inferior personages, or under an assumed name and character, to which they are natural and appropriate. No respectable writer adopts them into his own proper vocabulary, and parades them in defiance of polite usage, whatever may be his theme or purpose. Or if, from poverty of resources, an expressive foreign or newly coined word is introduced, a sort of apology is offered by italics, or quotation marks, or a "so to speak" in parenthesis, showing a decent sense of shame for a violation of the purity of the English language. Such words as "crool," "roiled," "creep-mouse-catch'em precedent," "trapsed," "spelled" in the sense of "relieved," and others of the same class, would, perhaps, be very reluctantly sacrificed by the author, the surprise and diversion they excite by their saucy intrusion being easily mistaken for the sensation produced by wit. It is probable that the very metaphors and phrases, which are most objectionable in point of taste, are favorites of the author, endeared to his fancy by some mysterious associations, which, like parental partiality, make him blind to their impertinence.

The introduction of uncouth and grotesque ideas, without ceremony, among those of a superior class, seems to tickle the author's fancy, from the same arch defiance of propriety which transfers "Plumy Alicia" from the Governor's kitchen to her final position among his children, with no intermediate culture, moral, mental, or social, that we hear of, during her somewhat indelicate and discreditable career, to prepare her for so marvellous a promotion. In a work of fiction, there should be probability enough to create an illusion, or truth enough to persuade the judgment to wink at the momentary belief of the imagination in the real existence of the scenes and personages described. But we must be quite in dream-land before we can give ourselves up, without remembering the author biting the top of his quill and preparing a surprise for us, to his fantastic creations and gyrations, — to such leaps from the sublime to the ridiculous, and a rebound into the higher element more astonishing still; to such alternations of high and far-reaching thought with vagaries of unmitigated silliness. There are in this book descriptions of nature, and delineations of the inner world also, having an excellence of their own, and a felicity of language which would place the author by the side of Irving and Hawthorne; and there are death scenes of sentimental comedy and oddly profane tragedy, equally inimitable and exquisite in absurdity. There are constant flashes of genius, elicited as if by mere accident, in the headlong haste of composition. Many noble thoughts we dimly recognize, and strive to draw out from the whimsically colored drapery of words, which, like the language used by diplomatists, conceals more than it reveals. There is a pervading spirit of brotherly feeling towards all men, and a truly inspiring piety, which makes itself felt equally by the most careless and the most critical reader; and a warm feeling remains in the heart when we close the book, to excite which would give any right-minded person a joy which no merely intellectual admiration, however unqualified, could impart. We are the better for this book, and it seems almost an offence against our better nature to make its literary imperfections a subject of comment. The solemn vibrating tone of a deep chord, struck with a bold and firm hand, often outlasts the jar of a succeeding false note; and we pass over an affectation in a very forgiving temper, when

our best feelings have been touched and refreshed by a thrilling melody. It even seems a species of ingratitude to find fault. A reviewer's office is a thankless one, and so far as it is a censorship, it involves an exercise of conscientiousness, especially in the case of friends or favorites, for which it must look for no credit or reward from any quarter, until new things have become old, and the general judgment regarding them fixed.

It requires no spirit of prophecy to see, that the author of "Margaret" will reach a much higher rank as a writer than he holds at present. There is much in his works that cannot die, should he write no more; quotations are already making the best passages as familiar as household words; and if the author should observe what gems have been thus generally selected, he will see what addresses itself most successfully to the heart, and is, at the same time, agreeable to the more discriminating judgment of the understanding. It is a rich vein which he is working, would he be more constantly at the trouble of separating the gold, or at least the ore, from the clinging soil. Richard Edney would be more effective with half the number of pages; but as it is, we are sure it is more generally read and liked than "Margaret." There are fewer dramatic inconsistencies in the story, and the excursions from it, in which the author seems to follow rather than guide his pen, are less frequent and less tedious.

Those scenes in which Richard and his pursuing, rather than accompanying, reader are allowed to rest awhile, and "make themselves at home" under the roof of Munk, are natural and delightful. The style in these portions of the book is generally more playful than eccentric, and exactly suits the subject. There is little to disturb our conviction of the truth of the whole representation. The children are real beings to us, and Munk and Roxy excellent portraitures. The author has nowhere caricatured or distorted them, probably because they are subordinate personages, sketched lightly in the background of his village scenery. They are very unobtrusive, and perhaps commonplace, people, not dreaming of being famous in the world; but we are sure every one of the future readers of the book will, whenever they appear, have a pleasant feeling of recognition and acquaintance, a belief of having met them somewhere before.

Among mothers, and other female admirers of Memmy and Bebby, they are commonly supposed to be "drawn from the life," — probably from the author's own children. But we doubt the truth of this supposition. No mere daguerreotyping of fact can, like the conception of genius, seize upon the most characteristic and suggestive traits alone, and always preserve them in change and motion. Let any artist attempt to draw a portrait of his own children; we shall see a good likeness probably, but we need not expect them to walk out of the canvas. A full length portrait, especially, correctly done to the very shoe-string, is a very tame affair, at least to strangers, who have no associations which will help them to idealize it. A few well-cut outlines, — perhaps a sketch made in haste from memory or fancy, exciting rather than satisfying curiosity, and leaving just enough for the imagination to do in filling it up, is far more effective and delightful. Memory, to be sure, is the magazine of materials; but we doubt if Mr. Judd, or any other writer of genius, is conscious where or when he gathered each particular item of the store.

When we leave the threshold of Munk and Roxy, we leave consistency behind. From a heap of outlines, among which the shadows fall as if the light were purposely thrown from a many-sided reflector, the laboring imagination brings out figures much like those in Punch, with wonderfully big heads, making such speeches as were never concocted by any human brain, and uttering words the meaning and derivation of which not even a slang dictionary could expound. We admit that there is a great deal that is valuable and true in the mass; but more that is only in the way, and ought to be out of it. We are grateful for the bridge, and the freshet, and the picturesque river, which we get a view of by snatches; for the pond, and the water-party, and the stage-road, with its stage and driver; and even for the saw-mill and the boom. Our conviction of their reality brings us back to the firm footing of probability, out of the tangled morass of conjecture. Clover, we are told at the close, is not merely a bad man, but a type of a bad thing. At one time, we thought him the representative of physical might, and Richard of moral power; but anon Richard employs physical superiority to overcome him, in a scene where they are brought into direct contrast. Again, selfishness seemed typified in the character; but that

did not take in the braggadocio element, and the hideous impiety which we are made to swallow, as it were, whether we will or no. Finally, it seemed to represent a pseudo-republicanism, supposed to prevail among the profligate and unchristianized portion of our American population. The catastrophe, which borrows the thunderbolt as a special interposition of Divine vengeance upon this "embodiment of all horridness," is revolting not merely to our taste, but to our religious reverence. A *heathen* poet might not offend us by representing Jupiter hurling a thunderbolt upon the head of the mortal who had defied him. But as Christians, though we believe that we shall not escape the punishment of our sins, either as a nation or as individuals, we also believe that punishment is the necessary consequence of the sin itself, and that no violation of the laws of nature is needed to carry it into effect.

We regret that our limits will not allow any remarks on the philanthropic theory advanced and illustrated in this work. The subject is too important to be despatched in a paragraph, with any justice to what may be considered the original views of the author. "Phumbics," with his permission, we leave to the consideration of the printer, not that there is any cause which we can see, why the writer should hesitate to introduce a satire on political antagonism and proscription into a picture of a republican or "Rus-Urban" community, except that it is unintelligibly written.

We select the following specimen of the peculiarities of the author's style, which will also introduce the two most delightful personages in the book.

"Yes, Richard loved these children; and loved to be with them, and to amuse them, and to be amused by them. After his nap, — for he had had no sleep since the night before, and many things had happened, in the mean time, to excite and tire him, — after his nap, he came down into the kitchen, and sat by the stove. The children began their pranks, — they could not let them alone. Their mother was preparing for baking, and she could neither bear their pranks nor their presence; so she sent them into the middle of the room. They could not stop at that, but went clear over to Uncle Richard's knee, and rebounding thence, they fetched up with the other side of the room. They seemed to move together, as we imagine the Siamese twins to have done when they were children; having one will and one

centre of gravitation, like boys in a boat, or leaves in a whirlwind. Then, again, it was evident they had separate wills, and sometimes a sharp individuality of will would show itself. Memmy was the oldest, and the strongest, and we should expect her to lead off. So she did; but not always. Bebby's little individuality was mighty strong when it got roused, and it made up in storming what it lacked in solid weight. It was like a cat frightening a great dog by demonstration, — sheer demonstration. But Memmy generally went ahead; and Bebby wanted to do what Memmy did. They climbed to the window, and entertained themselves with the frost that glittered on the glass. Memmy printed her hand in it; holding it there till palm, thumb, and fingers melted their image into the glass; and Bebby did the same. It was cold work, and Bebby's fingers were red; but she was persevering; and when Memmy called to Uncle Richard to look at what she had done, Bebby did so too. Not that Bebby could speak a word; but she had a finger that was full of the energy of utterance; and she had a scream, too, that needed no interpretation, and her lips quivered eloquence. And then, — as if she possessed neither finger, nor throat, nor lips, — there was her eye; that told every thing. Poor piece of dumbness! she had a superfluity of organs; and her eye alone would have made way for her through the world, sans every thing else.

"Memmy laid down to it, as we say, and applied her face to the window, and she produced chin, lips, nose, eye-brows thereon; and turning to Uncle Richard, to show him what she had done, there glared, from the great ice-mountains which the frost creates on windows, this hideous ice-mask; and did n't Uncle pretend to be frightened? and did n't Memmy laugh? But Bebby got up something as good, and more humorous; for she laughed, herself, while she was making it; and then her mouth was so pinched with the cold, she could hardly laugh, and tears streamed down through what she did laugh.

"Memmy then took a slate-pencil, and Uncle had to fit Bebby a sharp stick, and they set to work, scratching figures in the frost. Memmy effected rude houses, and ruder rings for heads, and triangular skirts, and points for feet, and called the whole boys and girls. Bebby scratched at random, straight lines, and cross lines; but it was all the same to her, and she meant it to be all the same to everybody else; and she, in her way, called it boys and girls and houses, and her eyes sparkled, her lungs exploded, her frame vibrated all over, when she told it.

"But we must come back of what we have written, a little; we are overstating the case. We say Bebby could not talk; people generally said so, and we incidentally fell into the common error. But it would not do to say this before Memmy; she

would be instantly upon you. "Bebby can talk; she can say 'Ma, Ma,' and 'No, No,' and 'dum, dum,' and 'bye, bye,' and 'there!' She has got teeth, now!" It was an old idea of Memmy's that Bebby could not talk because she had no teeth; she said the gums covered her teeth all up, and the words, too. But the teeth came, — at least, two or three of them got out of their entanglement, — and then she could talk; and she did talk. So declared Memmy; and when the mother of the child and the father spoke of its defect and backwardness in this respect, Memmy always came forward with a stout demurrer.

"We say this, that the children may have full justice; and we say it for Richard's sake, who took Memmy's side in the controversy, and always defended the ground that Bebby could talk.

"Uncle Richard was reading a newspaper, but — the selfish imps! — they would not tolerate that; they would have no interference with *their* rights; they were news enough for him; accident and incident; hair-breadth escapes; wonderful discoveries; they were foreign news and domestic news; they had their poet's corner, and their page of romance. And they had some original thoughts on perpetual motion and the quadrature of the circle, and were crowded with pictorial advertisements of as many strange things as Barnum has in his Museum.

"Bebby was more blond, and soft, and supple, than Memmy, or than Memmy ever had been. Memmy's hair was darker, and lay smooth on her head; but Bebby's was all in a toss, and always in a toss; it was not curly, but flocculent, and had a pearly lustre, and it hung on her like the fringe of the smoke-tree, and looked like a ferment of snow, a little cloud of snow-dust flying about the room.

"Memmy pulled off her shoes and stockings, — this was not allowed, but mother's back was turned, and Uncle looked on so smilingly, — and Bebby's were off in a trice; and they went pattering and tripping barefoot. Memmy got into the bed-room, and hid, and cooped; and Bebby found her; and there were great bursts of astonishment and pleasure. Then Bebby undertook to do the same; but she cooped before she got to her hiding-place, and then she frisked round trying to find herself, and this made them still more obstreperous.

"Mother went out of the room a moment, leaving a bowl of Indian meal on the table. No sooner did Memmy spy this, and see the coast clear, than she pushed a chair alongside the table, and fell to dabbling in the meal. Bebby must follow suit; she shoved a chair all the way across the room, and they both stood on the margin of the meal-bowl. This was rare sport; it was something new for Bebby, — she never had got so far before, —

she had never thrust her hands into meal. Memmy had, — Memmy was used to it. But Bebby, she was awed, and she was enraptured; she was on Pisgah's top, and Canaan lay fairly before her, — only she was a little afraid of Jordan. Why should she crow so? Why should she be so all in a tremble? What did she want of the meal? But into it she dove both arms, to the elbows; she lifted it with her hand, she crumpled it in her fist, she sifted it through her fingers; she made piles of it, and scattered them. Then she looked at her fingers, and on her dress, and on the table; and when she saw the meal spilled everywhere, she seemed half frightened. Had n't she a conscience, and was n't some fiery young Nemesis scourging her insides? — Did she love the feeling of the soft powder? had she a passion for dust? would she wallow in the mire, if she had a chance? Inexplicable little meal-stirrer! Memmy sprinkled some on Bebby's head, and Bebby tried to reciprocate the favor. Mother came back. "Richard," she screamed, "how could you let them do so?" Richard had done nothing about the matter, except to look on. "Was n't that enough?" said she; "could n't you see it? did n't you see it?" Seizing Bebby by the shoulder, she held the child square round, for Richard to look at. "Her tire," she continued, "was span-clean this morning; her hair is full of it! O, I shall go off the handle! Have you no heart, brother? Could n't you feel, as well as see?" "It is nothing very bad, I hope," said Richard. "All covered with this dirty meal!" exclaimed Roxy. "Your meal is not dirty, is it, sister?" "Don't joke, brother! It is a serious case; the children are forming very bad habits!"

"Habits of what?" asked Richard.

"Habits of getting into things," she replied.

"That is not a bad habit, — is it?"

"Habits of getting dirty. And I always said, if ever I had a child, it should be kept clean. If there is any thing in the world most disagreeable, it is a dirty child."

"The children are not disagreeable to me," said Richard.

"They are not to me," rejoined his sister; "but they are to other people."

"It seems to me," added Richard, "I would not trouble myself much about other people, if I was satisfied myself. 'Other people' are numerous; and if the little ones are to be adjusted to their caprice, I fear they will have a hard time of it in life, and will wonder what they were born for. Besides, 'other people' are a good ways off, and have really small concern in Memmy and Bebby." pp. 82 – 87.

Our readers who may not have seen the book will thank us for extracting the following beautiful passage.

"However joyous or certain may be Immortality; however undesirable, in any instance, may be the prolongation of this earthly existence; however certified we are of the salvable condition of our friends,—still, it is hard parting. Not the immediate prospect of Heaven, not the presence of the Angel of Bliss, can prevent the bitterness of emotion. We weep from sympathy, and we weep from sorrow; and sympathy makes the sorrow of many one. In a moment, as by electric communication, all hearts coalesce; and Miss Eyre wept as purely, as deeply, as Barbara.

"It is hard parting: the cessation, the giving over, the farewell, the last view; the absence, the being gone; nothing for the eye to look upon, or the hand to feel, or the tongue to speak to; the withdrawal of the spirit, the burial of the body; the silence, and the lonesomeness.

"It is hard parting: the room is bereft, the table is bereft; old clothes and old utensils are bereft; the trees are stripped, the landscape is lonely. There is a ceasing to talk, when the thought is full; a ceasing to think when the heart is full; a ceasing to inquire and to communicate; a ceasing to gather reminiscences and to revive attachments. The subject is gradually dropped from speech, and from letters; dropped from the countenance and the manner; it passes into an allusion, it withdraws from the world, it cloisters itself in the eternal sensations of the loving soul.

"It is hard parting:—but it is not all parting,—there is a going, too; there is an elevation of spirit, as well as depression of the flesh. The parting takes us along with it. It raises us from the limitable to the Illimitable. It gives to Faith its province, and to Hope its destiny. Beyond this vale of tears, our friends await us in the eternal Bloom!

"It is hard parting:—but there is a remaining, too. All does not go. There are blessed memories and sweet relics still in our hands, still sleeping on our bosoms, still sitting by the fireside, still coming in at the door. Beauty, Holiness, Love, are never sick; for them is no funeral bell. That face visits us in our reveries when we wish to be all alone with it; an Ascended face, it shines on our despondency, and smiles on our love; it peoples the solitude with a sacred invisibility; it introduces us to the realm of the departed, to converse with spirits—to commune with saints. The medium between us and the dead is a purifying one. It cleanses the character; we see nothing bad in what is gone; there is no remembrance any more of sin; we are ravished by virtues perhaps too late recognized; we adore where we once hardly tolerated;—a departed friend is always an image of pure crystal.

"And the body, the transient tabernacle, the clayey tenement, has its wonderful mission. It hastens to repair the rent in our

hearts, by its look of angelic peace, in the forest; as a prostrate tree hides its decay in a vesture of green moss, so the body endues the pain and the waste of sickness with an expression of health and repose.

"When the last agony was over, the features of Violet resumed their wonted composure; — beautifully on the pale cheek lay the long, silken eye-lashes; on thin lips flickered a smile, as it were a shadow reflected from the ascending, beatified spirit. The Lady Caroline crossed over the silent breast the lily hands, and smoothed on the forehead the flaxen hair; and the well-defined eyebrows were still that western cloud, floating between eyes that had set forever and the azure expanse of the forehead above." pp. 231 – 233.

We copy also the following picture of a cold night in a saw-mill.

"It was an extreme night, and the mercury fell to a great depth before morning. One man, who raised the largest cucumbers, and had the most satisfactory children, and drove the prettiest carryall, said his thermometer, at thirty-eight minutes after seven, stood at five and three-quarters below zero. At any rate, it was cold enough; and Richard felt it, when he left the house, after supper. Its first onset was suffocating, like a simoon; then it began to cut, and sting, and flay, as if it would not only entrap but torture its victim. A delicate, thin, violet vapor, coming from we know not where, had clearly mistaken the time of the year, like birds arriving too early from a sunnier clime; benumbed and bewildered by the cold, it lay on the western hills, still, calm, hard, and dry. The sky was very clear, as if the cold had driven out of it all those soft clouds, and gentle zephyrs, and spiritual mists, on which our better feelings float through the universe, and by which our souls are indefinitely expanded, and our sympathies connected with unseen orders of beings, and left it the impersonation of intellect, — sheer, naked intellect, — intellect without love, without tenderness; awful, dismal intellect, in which the stars were so many iron, piercing, excruciating eyes — eyes which one did not wish to look at, but ducked his head, and hurried on. Or, if one could stand it, — if his fancy would have its way, in spite of the cold, — he would see the windows of heaven covered with frost, and the stars so many little crystalline sparkling points; and if he looked closely at Sirius, he would inevitably conclude it had been snowing there all winter; and the icy, glittering radiance of that star he would attribute to the reflection of interminable hollows, and mountains of snow.

There were no loafers about the mill to-night; and no boys skating on the river, with their cheerful fires, and the bell-like

ringing of their merry voices. The great doors on the sides of the mill, that open on horizontal hinges, and are hoisted by ropes, were dropped. The wind drifted freely through the building; and the large, cylindrical, red-hot stoves, seemed to be an invitation to it to come in. Nor was it ceremonious, or hardly civil; it crowded about the stoves, and seemed determined that nobody else should have a place; and with a selfishness which nothing human ever paralleled, as soon as one windy troop got warm, it made way for another, and so left no chance at all for the workmen. Green Mill was a large one, — two hundred feet long, and fifty wide; and all the saws were running; not that they always ran in winter, but these were pressing times. It was one immense hall, where the saws were, mounting to the ridge-pole, and broken only by the tie-beams, and the frames in which the saws moved; and all the men might be seen, and their varied operations inspected, at a glance. It was a noisy, busy scene. Lamps hung on the fender-posts — lamps shaped like a coffee-pot, with a heavy coil of wicking in the spout, and producing so large a flame the wind could not blow it out; and the more it was attempted to be put down, the brighter it burned. But the lamp was provoking; it affected great nonchalance; it made feints of being beaten; it fell over from side to side; it treated the wind as a rope-dancer might treat his worst enemy, by capering on a slack wire, and jingling a tambourine in his face; it was as insulting as a runaway monkey, that makes grimaces at his master from a chimney-top.

On one bed the men were butting; on another, hauling up the slip; on a third, dividing the logs by cross-cut saws; the creak of files, and the clink of iron bars, could be heard. The up-and-down saws sweltered, trembled, gnashed, hissed, as they made their way through the huge trunks before them. There was the piteous shriek of the cutting-off saw, and the unearthly rumbling of the wheels in the pit below. The rag-wheels patiently ticked, as it were time-keepers of the whole concern. The entire building, ponderous as were its beams and firm its foundation, seemed to throb and reel." pp. 46 – 48.

Art. X.—CRITICAL NOTICES.

1. *The Principles of Chemistry, illustrated by Simple Experiments.* By Dr. Julius Adolph Stockhardt. Translated from the Third German Edition, by C. H. Pierce, M. D. Cambridge: John Bartlett, 1850. 8vo. pp. 656.

The name of this author, so well known among practical men as one of the editors of the "*Polytecknisches Centralblatt*," would alone authorize the conclusion, that his book is preëminently clear, concise, practical in all its allusions to art, simple in its arrangement, and illustrated by experiments requiring no array of costly apparatus. It is a work worthy of its author, and which will bear the character we have given to it, even when subjected to the severest tests of critical analysis. Rather popular than philosophical, the style loses nothing of the precision adapted to science, though occasionally it seems to adopt the language of alchemy, and to clothe matter with the attributes of mind,—a spiritualization which we cannot commend. However well this may appear in German, when done into English, it becomes either puzzling or ludicrous, and reminds one of Punch's effusion,—"The Chemist to his Love." We hope the good taste of the publisher will expurgate such faults in a new edition. The method pursued is perhaps the most valuable characteristic of the work. The division of the subject, if not quite original, is new for a text-book, and equally well adapted to teacher and learner. The facts are stated forcibly, while the great principles and laws of Chemistry are developed and explained in a manner equalled by few chemical works in our language, and surpassed by none except the elaborate "Elements of Chemistry," by the late Professor Turner, of the London University. Many, whose notions of the laws of chemistry were not very precise, may remember how the beautiful section of Turner on the "proportions in which bodies unite," gave them a new sense of the simplicity of the laws which govern "chemical combinations." On this subject our author has few rivals. In the busiest of his experiments, he never loses sight of a principle to be established. Before the pupil becomes aware of the existence of definite laws, he finds himself familiar with the combining proportions, the saturating power, of radicals, acids, and bases. When at last the learner opens that chapter in the midst of the book, in which the "laws of chemical combination" are "reduced to a methodical system," he finds that he is only pleasantly reviewing his previous knowledge, and impressing it anew on his memory by deductions and

associations equally logical and scientific. We must not omit to notice the practical illustrations, the ready and neat explanations of the chemical processes that are carried on, not only in extensive manufacturing establishments, but in the household chemistry of yeast-making, bread-making, brewing, soap-making, and divers culinary processes, which render this work better adapted to the teachers and pupils of our schools of every grade, to the solitary student and the apothecary's apprentice, than any other compendious treatises on the subject with which we are acquainted.

But though our general opinion of the work is very favorable, we hold that there are some heresies of doctrine in it, some erroneous statements, which should not have been allowed to go forth without an intimation that they had been perceived, if not corrected. We refer particularly to the *rationale* of the mode of preventing the evil effects of lead on the human system. Dr. Stockhardt justly avows that this metal is an insidious "enemy to human health," stealing its march upon its victims, and exhibiting its effects often "only after the lapse of years." He correctly classes lead among the slow poisons; but fatally mistakes when he says, that the sulphates present in spring water form in time a firm coating of insoluble sulphate of lead, which renders the use of leaden pumps, and, he might have added, leaden pipes, harmless. As the Professor "of Science applied to Art," whose name is appended to the introduction of this translation of Stockhardt, has shown that this is not true of all well water, and others have shown equally that it is not true of any water, we are surprised that the translator, himself a medical man, did not, on hygienic considerations alone, warn the readers of Stockhardt against pinning their faith and their health on such a statement.

The doctrine of vegetable physiology here set forth is essentially that of Liebig. However true this may be of plants in their normal state, it is found, when applied to cultivated crops, to be untenable. Practical farmers, acute vegetable physiologists, and expert chemists, among whom may be mentioned Professors Alubek and Schultz, in Germany, have established this fact; and it has been indirectly proved by the results of the patent manure devised by Liebig himself.

In the first American edition of this work, there were some minor errors, probably mere slips of the pen in the original, which we are glad to see corrected in the present edition.

We object to the latitude of the statement on page 55, where one measure of water is said to produce by its decomposition several thousand measures of oxygen and hydrogen gases. It would have been better to state exactly how much gas a measure of water would afford. We would call the attention of the editor to this statement, as it may serve to encourage the futile attempts

now making to illuminate the world by new lights. We find very few annoying errors of the press, unless the Webster fashion of spelling metre "meter" may be classed among them. Had we time and space, we should like to enter our reasons for protesting against the premature attempt made in this work to force upon us the centigrade scale. From our knowledge of the great inconveniences which have resulted and will result from its partial adoption, we trust the publisher will be induced to add to the centigrade the corresponding degrees on Fahrenheit's scale in a new edition, or append to the work a table for the conversion of one scale to the other. Our strong preference is for the centigrade; but our community cannot be expected to adopt it, so long as we use English weights and measures. When these are changed for the more correct and scientific usages of France, we shall hope to see the centigrade scale displacing that familiar household God, Fahrenheit's thermometer.

---

2. — *The Annual of Scientific Discovery, or Year-Book of Facts in Science and Art; exhibiting the most Important Discoveries and Improvements in Mechanics, the Useful Arts, Natural Philosophy, Chemistry, &c. Together with a List of Recent Scientific Publications, a Classified List of Patents, Obituaries of Eminent Scientific Men, &c.* Edited by DAVID A. WELLS, A. M., of the Lawrence Scientific School, Cambridge, and GEORGE BLISS, JR. Boston: Gould & Lincoln. 1851. 12mo. pp. 428.

THE advancement of science, in all its departments, is so rapid nowadays, that it is a breathless undertaking to follow it, and many readers give up the chase in despair. The ordinary scientific periodicals do not aid one much in "keeping the run" of discovery and invention; each one gives an imperfect record, with reference usually to but few departments of research, and depending in a greater or less degree on what is done in its own neighborhood. We need a compendious and popular chronicle of all that is accomplished in the course of the year, adapted chiefly to the use of readers not specially devoted to science, but serving as a convenient index even for those who are. And this we understand to be the plan of the work before us, the second of its series, which, as well as its predecessor, evinces sufficient labor and care in its preparation, and serves as a very respectable monument to the scientific activity of the year which has

lately closed. The Marquis of Worcester's "Century of Inventions" is now outdone by the labor of a twelvemonth. Some of his novel conceits were not found to work as well in practice as in theory; and the same remark will probably be found applicable to a good number of the inventions described in this volume. The sketch of them here given shows rather what they are intended to accomplish, than what they have actually done. Five years' experience will doubtless cause many to be abandoned entirely, and will detract a good deal from the magnificent promises held forth by others; so that, if the matter of this volume should be revised at the end of that period, it would lose much both in bulk and pretensions. A "Year-book," as this work is modestly called, can give only the judgment of the year upon its own performances; and into that judgment hope enters as a larger element than caution. The editors, therefore, have wisely not attempted the part of criticism, for which, indeed, the abundance of their materials left them little space, with due care to prevent the book from swelling to unreasonable dimensions. A view of the failures as well as the achievements of each year is not without its use; it teaches the process of invention, by erecting beacons along the ways where there are dangers to be shunned, and by pointing out other paths which it is desirable to explore, when any one comes forward with energy and skill enough to act as pioneer.

These remarks tend to lessen the force of the only criticism which readers might be inclined to make upon the manner in which this work is edited, — that the materials for it have been collected by drawing a seine over the scientific literature of the day, allowing nothing to escape which was too big to pass through its meshes. It may be, that a diligent sifting of the matter would somewhat reduce it in bulk; but we are confident that little could be thrown out which would not be missed with regret by one or another of the numerous classes of readers. The articles are well grouped under their appropriate heads, those relating to similar subjects being placed near each other, so that the work is very convenient for reference, and affords a good *conspectus* of those fields of science and art which are now most successfully worked. When the information afforded is too brief for any purpose but that of general curiosity, there is generally a reference to some work in which fuller details can be found. On the whole, the volume is both entertaining and instructive, and may often save one the labor of turning over many other books in vain when in quest of a scrap of information. For those who would acquire a smattering of knowledge about the latest improvements in science and art, it is invaluable. A modest prefatory note by the editors, which may be considered as a review of the contents

of the volume, closes with the following remark: — "that though the past year has not been productive of any preëminently brilliant discovery, yet quite as much has been added to the amount of human knowledge as during almost any previous year."

---

3. — *Report of the Board of Trustees of the University of Rochester, on the Plan of Instruction to be pursued in the Collegiate Department.* Presented September 16, 1850. Rochester: Sage & Brother. 8vo. pp. 50.

Nothing is more characteristic of our countrymen, and nothing more honorable to them, than the readiness with which they furnish large endowments to the higher seminaries of learning. The States, the different religious denominations, city and country, contend with each other in noble rivalry for this great purpose. The money is usually obtained by private contributions, individuals being as remarkable for their liberality in this respect as legislative bodies are for their parsimony. And one great good results from this fact,— that the institutions thus founded or assisted come under the control and management of a private body of trustees, and not of the legislature or the State, so that the revulsions and storms of the political world pass over them harmlessly, and the offices in them are not made the prizes of political ambition and effort. They are not shielded from sectarian influences to an equal extent, it is true; but each college or endowed academy which has any sectarian character, is the undoubted property or foster-child of some one sect, whose right over it consequently cannot be disputed, so that the jealousy or rivalry of other sects cannot injure it. Its religious character is determined by its founders, and cannot be subsequently affected, except by future dissension in the sect to which those founders belong.

The University of Rochester, to which the report now before us relates, is an institution just created, as we understand, by the liberality of members of the Baptist denomination in New York. Having liberally endowed it, a question necessarily came before them, which has been much debated for many years in this country, — what plan of instruction should be adopted in the collegiate department. Should the new institution be thrown open to all who might choose to enter it, there to pursue studies of their own selection as long as they saw fit, or should it be made a place for a thorough course of *liberal* education, to be marked out before-

hand, without reference to the specific callings which the graduates might subsequently adopt, but as a general preparation for all callings, — a course which should, in the language of Milton, amply qualify the recipient of it "to discharge honorably all the offices, both public and private, of peace and war." This is the question discussed in this Report, and discussed with great ability, candor, and circumspection. The conclusion formed by the committee is in favor of the latter branch of the alternative just presented. They have decided, — wisely, as we think, — to make the University of Rochester a place of *general* education in a *prescribed* course of studies. They are not in favor of beginning a special or professional education at the early age of fifteen or sixteen years, when boys generally enter college. They are not in favor of allowing such boys to choose their own studies under the caprice of the moment, instead of having the proper course selected for them by a board of competent professors or trustees. They do not think the additional number of students which might possibly be attracted by such an arrangement to be a good test of the efficiency of the institution; and they think, moreover, that there is very little probability that the number of pupils would be thus increased; for the experiment has been tried elsewhere, fully and freely, again and again, *and it has failed.* And there are obvious reasons for the failure. Those who do not want a full course of liberal studies as a general preparation for the business of life, but wish only a few studies, and to pursue them a little way, can obtain their object elsewhere more conveniently and more economically than within the walls of a college. Academies and high schools exist for the benefit of this class of students, and do their work admirably. Colleges cannot supersede these institutions, and it is not desirable that they should be superseded.

One concession, however, these Trustees make to what they conceive to be the demand of practical men among our very practical population. As objection is sometimes made to the study of what are called the dead languages, they have planned the course of instruction in such a way as to allow the student to pursue either the dead or the living languages, at his option. "If you do not like Latin and Greek," they say to him, "you may study French and German." We do not object to the experiment being tried in this form, for we think the result will be pretty much what it was, as we learn from this Report, in the Free Academy of the City of New York.

"The pupils of that institution have all received their preliminary education in the common schools, and are eminently the children of the people. They have perfect freedom of choice whether they will study the modern languages or Latin and Greek, and neither is compulsory. There have been four entrances, to wit: 143 scholars were admitted at

the first examination, 59 at the second, 53 at the third, and 81 at the fourth; and nearly three fourths of each class have chosen Latin and Greek."

We think the result will be what it was, ten years ago, when the same liberty of choice was offered to the three upper classes in Harvard College, and nine tenths of them chose Latin and Greek. In this country, it seems necessary for an experiment to be tried a dozen times, before the people can see that the results are uniform and decisive of the question. The sooner colleges recognize this fact, — that the objections to the study of Latin and Greek proceed from those who do not send their children to college, and would not send them under any circumstances, while all who are ambitious to obtain a truly liberal education wish to pursue classical studies, — the better will it be for these institutions, and for the cause of sound learning throughout the country.

ERRATA.

Page 119, 35th line from the top, for "fictitious," *read* factitious.
" 126, 1st " " for "vapid," *read* rapid.
" 133, 24th " " for "ever." *read* ever?
" 139, 24th " " for "power," *read* frown.
" 340, 1st " " for "will find," *read* will not find.

NEW PUBLICATIONS RECEIVED.

The Leather Stocking Tales. By J. Fennimore Cooper. Author's Revised Edition. Vol. III. The Pathfinder, or the Inland Sea. Vol. V. The Prairie; a Tale. Revised and corrected, with a New Introduction, Notes, &c., by the Author. New York: G. P. Putnam. 1851. 2 Vols. 12mo.

Lavengro; the Scholar — the Gipsy — the Priest. By George Borrow, Author of "The Bible in Spain," and "The Gipsies of Spain." New York: G. P. Putnam. 1851. 12mo. pp. 550.

The Poetical Remains of the late Mary Elizabeth Lee. With a Biographical Memoir. By S. Gilman, D. D. Charleston, S. C.: Walker & Richards. 1851. 12mo. pp. 224.

Salander and the Dragon: a Romance of Hartz Prison. By Frederic William Shelton, M. A. New York: George P. Putnam. 1851. 18mo. pp. 184.

A Guide to Scientific Knowledge of Things Familiar. By Rev. Dr. Brewer, Trinity Hall, Cambridge. Carefully revised and corrected, and adapted for use in Families and Schools of the United States. New York: C. S. Francis & Co. 1851. 18mo. pp. 426.

Crime and Punishment; or the Question, "How shall we treat our Criminals?" practically considered. By R. Hovenden. London: Charles Gilpin. 1849. 12mo. pp. 128.

A Tract of Future Times, or the Reflections of Posterity on the Excitement, Hypocrisy, and Idolatry of the Nineteenth Century. By Robert Hovenden. London: Charles Gilpin. 1851. 12mo. pp. 190.

A School Dictionary of the Latin Language. By Dr. J. H. Kaltschmidt. In Two Parts. 1. Latin-English. Philadelphia: Lea & Blanchard. 1851. 12mo. pp. 478.

Classical Series; Edited by Drs. Schmitz and Zumpt. T. Livii Patavini Historiarum Libri I, II, XXI, XXII. Philadelphia; Lea & Blanchard. 1851. 12mo. pp. 343.

The Works of Horace; with English Notes. For the use of Schools and Colleges. By J. L. Lincoln, Professor of the Latin Language and Literature in Brown University. New York: D. Appleton & Co. 1851. 12mo. pp. 575.

Historical and Statistical Information respecting the History, Condition, and Prospects of the Indian Tribes of the United States; collected and prepared under the Direction of the Bureau of Indian Affairs, per Act of Congress of March 3d, 1847. By Henry R. Schoolcraft, LL. D. Illustrated by S. Eastman, Capt. U. S. Army. Published by Authority of Congress. Philadelphia: Lippincott, Grambo, & Co. 1851. 4to. pp. 568.

The Memoir and Writings of James Handasyd Perkins. Edited by William Henry Channing. In Two Volumes. Boston: Wm. Crosby & H. P. Nichols. 1851. 12mo.

Miscellaneous Essays. By Thomas De Quincey, Author of "Confessions of an English Opium Eater." Boston: Ticknor, Reed & Fields. 1851. 12mo. pp. 251.

Iphigenia in Tauris, a Drama in Five Acts. By Goethe. Translated from the German, by G. J. Adler, A. M. New York: D. Appleton & Co. 1850. 12mo. pp. 155.

American Unitarian Biography. Memoirs of Individuals who have been distinguished by their Writings, Character, and Efforts in the Cause of Liberal Christianity. Edited by William Ware. Vol. II. Boston and Cambridge: James Munroe & Co. 1851. 12mo. pp. 452.

Letters from Three Continents. By M., the Arkansas Correspondent of the Louisville Journal. New York: D. Appleton & Co. 1851. 12mo. pp. 350.

Principles of Zoölogy; Touching the Structure, Development, Distribution, and Natural Arrangement of the Races of Animals, Living and Extinct, with Numerous Illustrations. Part I. Comparative Physiology. For the use of Schools and Colleges. By Louis Agassiz and A. A. Gould. Revised Edition. Boston: Gould & Lincoln. 1851. 12mo. pp. 250.

Across the Atlantic. By the Author of "Sketches of Cantabs." London: George Earle. 1851. 12mo. pp. 274.

Tallulah, and other Poems, By Henry R. Jackson. Savannah: John M. Cooper. 1850. 12mo. pp. 235.

The Annual of Scientific Discovery: or Year-Book of Facts in Science and Art, exhibiting the most Important Discoveries and Improvements. By David A. Wells, A. M., and George Bliss, Jr. Boston: Gould & Lincoln. 1851. 12mo. pp. 428.

The Old Red Sandstone: or New Walks in an Old Field. By Hugh Miller. Illustrated with numerous Engravings. Boston: Gould & Lincoln. 1851. 12mo. pp. 288.

Christ in Hades: a Poem. By William W. Lord. New York: D. Appleton & Co. 1851. 12mo. pp. 183.

A Copious and Critical Latin-English Lexicon, founded on the larger Latin-German Lexicon of Dr. William Freund: with Additions and Corrections from the Lexicons of Gesner, Facciolati, Scheller, Georges, &c. By E. A. Andrews, LL. D. New York: Harper & Brothers. 1851. 8vo. pp. 1663.

Report of a General Plan for the Promotion of Public and Personal Health, revised, prepared, and recommended by the Commissioners appointed under a Resolve of the Legislature of Massachusetts, relating to a Sanitary Survey of the State. Presented April 25, 1850. Boston: Dutton & Wentworth. 1850. 8vo. pp. 544.

Geology and Industrial Resources of California. By Philip T. Tyson. Baltimore: Wm. Minifie & Co. 1851. 8vo. pp. 164.

Parental Wisdom: or the Philosophy and Social Bearings of Education, with Historical Illustrations of its Power, its Political Importance, &c. By J. Antrobus. Second Edition, carefully revised and reconstructed. London: Saunder & Otley. 1850. 8vo. pp. 276.

History of Greece. 1. Legendary Greece. 2. Grecian History in the Reign of Pisistratus at Athens. By George Grote, Esq. Boston: John P. Jewett & Co. 1851. 2 vols. 12mo.

Essays on Exchange, Interest, Money, and other Subjects. By J. R. McCulloch. Boston: Crosby & Nichols. 1850. 8vo. pp. 144.

Chronicles and Characters of the Stock Exchange. By John Francis. First American Edition. To which are added Stock Tables from 1732 to 1846; Dividends on Bank of England Stock from 1694 to 1847, &c. Boston: Crosby & Nichols. 1850. 8vo. pp. 167.

A Practical Treatise on Banking. By James William Gilbart, F. R. S. New York: George P. Putnam. 1851. 8vo. pp. 450.

The Banker's Common-Place Book. Boston: Phillips, Sampson & Co. 1851. 12mo. pp. 137.

The American Union: a Discourse delivered on Thursday, December 12, 1850, and repeated on Thursday, December 19. By Henry A. Boardman, D. D. Philadelphia: Lippincott, Grambo, & Co. 1851. 8vo. pp. 56.

Brief Remarks on the Hygiene of Massachusetts: being a Report to the American Medical Association. By Josiah Curtis, M. D. Philadelphia. T. K. & P. G. Collins. 1849. 8vo. pp. 70.

The Signs of the Times: or the Popery of Protestantism. London: H. J. Gibbs. 1850. 12mo. pp. 55.

An Address on Popular Education in Virginia, in connection with the proposed Changes in the Organic Law. Delivered July 13, 1850. By John Howard, Esq. Richmond: Elliott & Nye. 1850. 8vo. pp. 34.

Objections to the Act of Congress, commonly called the Fugitive Slave Law, answered, in a Letter to Hon. Washington Hunt. By James A. Dorr. New York. 1850. 8vo. pp. 15.

Address delivered on the Dedication of Magnolia Cemetery, on the 19th of November, 1850. By. Charles Frazer. Charleston, S. C. 1850. 8vo. pp. 23.

The Dove and the Eagle. Boston: Ticknor, Reed, & Fields. 1851. 12mo. pp. 27.

The Dangers and Duties of the Mercantile Profession: an Address delivered before the Mercantile Library Association, at its Thirteenth Anniversary, November 13, 1850. By George S. Hillard. Boston: Ticknor, Reed, & Fields. 1851. 12mo. pp. 67.

The New Dido. New York: Henry Kernot. 1851. 12mo. pp. 24.

An Address delivered at Topsfield in Massachusetts, August 28, 1850, the Two Hundredth Anniversary of the Incorporation of the Town. By Nehemiah Cleaveland. New York: Pudney & Russell. 1851. 8vo. pp. 113.

On the Velocity of the Galvanic Current in Telegraph Wires. By B. A. Gould, Jr. New Haven: B. L. Hamlen. 1851. 8vo. pp. 28.

The Transfiguration: an Exegetical Homily. By Rev. C. Porterfield, A. M. Gettysburg: H. C. Neinstedt. 1850. 8vo. pp. 36.

The Banker's Magazine, and Statistical Register, for 1850. Edited by J. Smith Homans. Boston: J. Smith Homans. 8vo.

The Cæsars. By Thomas de Quincey, Author of "Confessions of an English Opium-Eater," &c. Boston: Ticknor, Reed, & Fields. 1851. 12mo. pp. 295.

Poems. By Henry Theodore Tuckerman. Boston: Ticknor, Reed, and Fields. 1851. 12mo. pp. 175.

Warreniana: with Notes Critical and Explanatory, by the Editor of a Quarterly Review. Boston: Ticknor, Reed, & Fields, 1851. 12mo. pp. 192.

INDEX

TO THE

SEVENTY-SECOND VOLUME

OF THE

North-American Review.

Adlerstein, The Last Two Years of Hungary by, reviewed, 205 — cited, 223.

Agassiz, Louis, Principles of Zoölogy by, reviewed, 84 — cited, 97, 101 — on the plurality of origin of the human race, 114.

Agriculture, college instruction in, 74.

Agrippa, Cornelius, true history of, 90.

Agua Nueva, Gen. Taylor's advance to, 38 — picturesque position at, 39.

Aguilar, Grace, stories by, 159.

America, Collegiate Education in, 60 — foreign experience not serviceable in, 62. See *College*.

Ampudia, Gen., negotiates with Gen. Taylor, 33.

Anglo-Saxon race portrayed in Ivanhoe, 336 — passive virtues of, 337.

Annual of Scientific Discovery, noticed, 508.

Architecture, J. Ruskin's Seven Lamps of, reviewed, 294 — schools and orders of, *ib.* — peculiarities of national, 295 — Greek and Roman styles of, 296 — Christianity makes a change in, *ib.* — Gothic, 297 — of the cathedral, 298 — effect produced by, 300 — associations developed by, 301 — dependent on laws of the mind, 302 — spirit of sacrifice required in, 303 — and therefore religious, 304 — needs religion, 305 — truth in, 306 — kinds of deception in, 307 — fresco painting in, 308 — power and beauty in, 309 — ornament must be seasonable in, 310 — life in, 311 — memory awakened by, 313 — obedience as a principle of, 315.

Arnold, Dr. T., History of Rome by, reviewed, 442 — his work characterized, 447 — on the literature of Rome, 449 — extent of his work, 453.

Astronomy, Herschel's Outlines of, 371.

Atmosphere, pressure of the, 485.

Bacon, Roger, true history of, 90.

Banks, services rendered by, 409, 411.

Barometer, doctrine of the, 485 — horary variations of, 486.

Becket, contest of, with Henry II., 330.

Beecher, Miss C. E., Truth stranger than Fiction by, reviewed, 151 — motives of, in writing such a book, 167 — story told by, 168 — should not have published at all, 169.

Bemis, George, Report of the trial of J. W. Webster by, reviewed, 178 — accurate and trustworthy, 179. See *Homicide*.

Bertrand de Born, Thierry's view of, 330.

Bible, The, teaches religious, not scientific truth, 348 — never becomes obsolete, 349.

Bird, Dr. Golding, Elements of Natural Philosophy by, reviewed, 358 — several editions of his work, 374 — comprehensive and succinct, 375 — defects and mistakes of, 376 — corrections of, 377 — number of errors in his work, 379 — badly printed, 380 — blunders in the American reprint of, 381.

Bliss, George, Scientific Annual by, noticed, 508.

Bretschneider as a lexicographer, 276.

Brewster, Sir David, on Optics, 372 — defects of, 373.

Brougham, Lord, on the constitution of Hungary, 206.

Brown University, F. Wayland's Report on, 60.

Buccaneer, The, by R. H. Dana, analyzed, 136.

Buckingham, J. T., on newspaper literature, noticed, 249.

Buena Vista, Gen. Taylor's position at, 41 — Santa Anna's advance on, 42 — preparations at, 43 — incidents of the battle at, 45 — victory at, 52.

Cæsar, Julius, moral character of, 454 — not cruel or vindictive, 455 — fought for the people against the aristocracy, 456 — displaced only the shadow of a republic, 457 — virtually chosen by the people, 458 — policy of, 459 — use of power by, 460 — Merivale's view of, 461 — reforms made by, 463 — compared with Pompey, 464.

Cato, Portius, character of, 452.

Centigrade thermometer compared with Fahrenheit's, 391.

Chemistry, Dr. Stockhardt's principles of, translated by C. H. Peirce, noticed, 506.

Children, stories written for, 153 — mere moralizing useless to, 155 — have a craving for narrative, 156.

Christian Consolations, by A. P. Peabody, 343 — general tone of, 352 — fit topics for, 353.

Christian Examiner, The, on Hungary, reviewed, 205 — document misdated by, 221, *note* — on offices conferred by the Magyars on men of other races, 226, *note* — marvellous statement of, 240 — on historical inaccuracies, 241 — refutation of its historical statements, 242 — grave charge uttered by, 246 — this charge refuted, 247 — misrepresentation of, *ib.* — reckless assertions of, 248.

Christianity, the supernatural element in, 344 — opposed by overweening trust in physical science, 345 — supplies light to science, 346 — never made obsolete, 349 — distinguished from science, 350 — revealing new ideas, needs new words, 280.

Cities and towns, how their growth is fostered, 430 — unequal distribution of, in the United States, 431 — Wakefield's scheme for fostering, 438.

Classical instruction in American colleges, 75 — carried far enough, 76.

College Education in America, F. Wayland's Report on, reviewed, 60 — experience of foreign countries throws no light on, 62 — exemplified at Harvard, 63 — religious tone of, 64 — founded on the English exemplars, 65 — amount of, before the Revolution, 66 — spirit of liberty prevalent in, 67 — supported by endowments, 68 — early condition of, 69 — has not deteriorated, 70 — furnishes as able men as ever, 71 — has lost its relative superiority, 72 — practical science a part of, 73 — classical instruction in, 75 — Wayland's proposed change in, 77 — should not be left to the student's choice, 78 — comprehensiveness of, 79 — real object of, 80 — the study of the English language in, 81 — parental character of, 82 — good in the main, 83 — science to be included in, 359 — prematurely ended, 360 — compared with the education which the world gives, 361.

Colonies, ancient, how formed, 432 — contrasted with modern, 434 — the Mormons adopt the former, 436 — Wakefield's theory about, *ib.*

Conquest, The Norman, of England, 319 — Thierry's view of, 321 — the consequences of, developed, 323, 325.

Coues, Samuel E., System of Mechanical Philosophy by, reviewed, 466 — simplicity of his theory, 469 — attractive qualities of his book, 473 — asserts the identity of force, 474 — on rotation and revolution, 475 — on the motion of falling bodies, 476 — on vibratory or molecular motion, 477 — on oscillation, 480 — on waves, 481 — on whirlwinds and other vortices, 483 — denies weight, or tendency to fall, 484 — denies the pressure of the atmosphere, 485 — on the barometer, *ib.* — on oscillation of the earth's crust, 486 — fallacious argument of, 488 — mistaken about the pressure of fluids, 489 — and the buoyancy of bodies, 490 — on the Magdeburg hemispheres, 491 — general commendation of, 492.

Cowper, Miss Catherine, children's stories by, 154.

Dana, Richard H., Poems and Prose Writings by, reviewed, 115 — strong individuality of, 116 — power and delicacy of, 117 — imaginative qualities of, 118 — style and sentiment of, 119 — his love for the past, 120 — cited, 121, 124 — his Essay on Law, 123 — on forms of government, 125 — on the evils of society, 126 — as a critic, 127 — on the Bible, 129 — his Idol Man, 131 — poetry of, 133 — his idea of poetry, 134 — analysis of, and extracts from, The Buccaneer, 136 — Factitious Life by, 144 — other poems of, 145 — on Greenough's Statue, 146 — a true poet, 149 — hope of other works by, 150.

Dark Ages an inappropriate name, 87 — cost of books in the, 88 — science in, regarded as necromancy, 89 — little diffusion of knowledge in, 91.

Degerando on public opinion in Hungary, cited, 210.

Dunder, W. G., Narrative of the Revolution of October in Vienna, reviewed, 206.

Edwards, Jonathan, as a writer and thinker, 81.
Egypt, science made a mystery in, 85.
England, Thierry's theory of the history of, 321 — influence of the Norman Conquest on, 323 — how long thus affected, 325 — three distinct races in, 329.

Factitious Life, by R. H. Dana, 144.
Female Authors, works by, reviewed, 151 — motives and peculiarities of, 152 — increase in the number of, 153 — moral and religious aims of, 154 — works for children by, 155 — ample room for, 159 — Marmontel's satire on, 160 — risk incurred by, 161 — half contemptuous leniency towards, 163 — rights and privileges of, 164 — allowed more freedom in matters relating to love and marriage, 165 — how guarded, 166 — "Rural Hours," by a Lady, 171.
Florida, Gen. Taylor's campaign in, 11 — battle of Ochechobe in, 12 — plan of warfare in, 14.
Footprints of the Creator, by Hugh Miller, reviewed, 84 — cited, 103, 105.
Force, identity of, 474 — indestructible and transferable, 477 — relation of, to velocity, 479.
Foster, Sir Michael, on the law of murder, 184, 193.
Fowler, William C., English Grammar by, noticed, 252.
Free Trade, W. Phillips on, reviewed, 396 — general doctrine of, correct, 413 — but inapplicable to America, 414 — inconsistent with the let-alone principle, 422 — confines a people to rude labor, 425 — its effects shown in Ireland, 426.
Fresco architectural painting condemned, 308.

Galeotti, Martius, true history of, 90.
Genesis of the Revolution in Hungary reviewed, 205 — cited, 219.
Gothic architecture, 297 — freedom and variety of, 299.
Gould, Aug. A., Principles of Zoölogy by, reviewed, 84 — cited, 97.
Grammar, English, W. C. Fowler on, noticed, 252.
Greece, distinction between exoteric and esoteric knowledge in, 86.
Greek and English Lexicon of the New Testament, by E. Robinson, reviewed, 261 — ideal of a perfect, 268 — Schleusner's, 269 — meaning of καί in, 273 — Wahl's, 275 — Bretschneider's, 276 — Hebrew idioms in, 280 — other peculiarities in, 281 — meaning of θεός in, 283 — of ἄγγελος, 284 — of 'heaven' and 'hell,' 285 — of other New Testament words, 286 — attic purity of, 288.
Greek architecture, 295.
Guyot, Prof., Earth and Man by, 93 — religious thoughts of, 99.

Harrison, Fort, garrisoned by Z. Taylor, 5 — attack of the Indians on, 6.
Harvard College, scheme of education in, 63 — religious but liberal tone of, 64 — early course of instruction in, 65 — amount taught in, before the Revolution, 66 — has continued to improve, 70 — multiplication of studies in, 82.
Hauer, Von, on the Finances of Austria, 206 — cited, 229.
Hebrew idioms in the Greek New Testament, 280.
Henry II., contest of, with Becket, 329 — causes of his troubles, 330.
Herschel's treatise on light, 370 — and on astronomy, 371.
History of Rome, by Arnold and Merivale, reviewed, 442 — study of, in modern times, 443 — causes of the taste for, 444 — modern improvements in, 445 — effects of the republican spirit on, 446 — two types of, 447.
History, Thierry's Ten Years in the Study of, reviewed, 316 — labor and reward of writing, 317 — politics a motive for writing, 318 — of the contests of races, 325 — unity and coherency of, 326 — office of hypotheses in, 327, 337 — diversity of the elements of, 328 — consideration of races in, 329 — Thierry's theory of, inadequate, 332 — influence of Scott on, 334 — bearing of ethnology on, 339.
Homicide, the law of, 178 — as applied in J. W. Webster's trial, 181 — when it becomes murder, 182 — authorities cited respecting, 184 — ambiguity in the law of, 186 — when malice is presumed in, 187 — division of, 190 — why presumed to be unlawful, 191 — inference of malice in, must be a natural presumption, 197 — importance of the legal principles of, 203. See *Murder*.
Hungary, various authorities on the late war in, reviewed, 205 — Lamartine and Brougham on, 206 — number of Magyar nobles in, 207 — power of these nobles in, 208 — fate of the non-Magyar races in, 213 — despotic opinions of the nobles in, 214 — state of parties in, 215 — democracy feeble in, 217 — hostility of races in, 219 — treatment of Croatia by, 220 — memorial of the ministers of, 222 — debate in the Diet of, 223 — merciless war waged against the Servians by, 224 — judicial murders by the Magyars in, 226 — connection of Transylvania

with, 228 — abandoned by the respectable part of the nobility, 230 — Declaration of independence by, 231 — Magyar policy in, 232 — Slavonian feeling in, 233 — tardy concessions to the other races in, 234 — result of the struggle in, 236 — dangerous to tell the truth about, 237 — odious and tyrannical aristocracy of, 238 — unnatural allies of, 239 — Christian Examiner on, 240 — discussion of points in the early history of, 242 — grave misstatements respecting, 247.

Ille Man, by R. H. Dana, 131.
Ireland, effects of rude labor in, 426 — many natural advantages of, 427 — affords no market for manufactures, 428.
Kepler's laws, abridged statements of facts, 467.
Kossuth on sending help to Austria against the liberals in Italy, 223.

Labor, rude and skilled, 423 — different effects of, 424 — evil effects of confining a people to the former, 425 — exemplified in Ireland and Massachusetts, 426.
Laissez-faire principle in political economy, 403 — illustrated and defended, 419 — limitations of, 420.
Lamartine on the war in Hungary, 206.
Lands, public, how disposed of, 437 — in the United States, 438 — price of, should not be diminished, 439 — effects of forcing the sale of, 440 — thinly peopled, 441.
Languages, philosophy of, 264 — study of the roots of, 266 — use of particles in, 270.
Law, R. H. Dana on a regard for, 123.
Lectures as a means of instruction, 365 — to be combined with the text-book, 366.
Lexicography of the New Testament, 261 — aid furnished by, 262 — improvements in, 263 — philosophy of, 264 — renders aid to history, 265 — causes of the progress of, 266 — made symmetrical, 267 — work to be done in, 269 — office of particles in, 270 — defects of former works on, 271 — not mere drudgery, 278 — Passow's opinions of, *ib.* — Dr. Robinson's merits in, 289 — the English have done little for, 291.

Magdeburg hemispheres, doctrine of the, 491.
Malice an essential element of murder, 183 — when presumed, 186 — the ground of this presumption, 188 — definitions of, 192 — Hale and Russell on, 195 — cannot be inferred from the mere proof of homicide, 199 — not presumed by the policy of the law, 200 — rebutted by the presumption of innocence, 201 — is not inferred from secret killing, 202. See *Homicide*.
Mailath, Count, history of Austria by, reviewed, 205 — cited, respecting the war in Hungary, 220.
Marmontel's satire, *La Femme Auteur*, 160.
Massachusetts, effects of skilled labor in, 426 — few natural advantages of, 427 — affords a large market for manufactures, 428 — great civic population of, 431.
Mathematics needed to aid physics, 362 — and to express the laws of the universe, 363 — embarrassment in the study of, 365 — not facts, but abstract theorems, proved by, 469.
McCulloch on the constitution and nobility of Hungary, 208 — on its history, 245.
Mechanical Philosophy, by S. E. Coues, reviewed, 466 — simplicity of, 469. See *Newton* and *Coues*.
Merivale, Charles, History of the Romans by, reviewed, 442 — his work characterized, 448 — his character of Portius Cato, 452.
Metamoras, fort built opposite to, 18 — cannonade and bombardment from, 22.
Mexico, causes of the late war with, 15 — beginning of hostilities with, 18 — incidents in the war with, 19. See *Taylor*.
Microscope, rule for finding the power of a, 36.
Miller, Hugh, Footprints of the Creator by, reviewed, 84 — merits of his writings, 95 — argues against the "Vestiges," 103 — defence of religion by, 105.
Mississippi regiment at Buena Vista, 45, 47.
Momentum, doctrine of, 479.
Monterey, march to, 26 — position and strength of, 27 — attack on, 28 — desperate fighting at, 29 — storming of, 31 — capitulation of, 35.
Mormon city in Utah, 436.
Motion, natural, whether rectilinear or curvilinear, 468 — force, the unknown cause of, 474 — vibratory, 477.
Müller, Dr. J., Principles of Physics by, reviewed, 378 — French work translated by, 383 — improvements made by, 384 — merits of, 385 — blunders in the translation of his work into English, 386 — specimens of these blunders, 387 — weights and measures adopted by, 390 — uses the centigrade scale, 391

— blunders of the American editor of, 392 — English and American editions of, 394.

Murder, legal definition of, 182 — the Attorney-General on the law of, 183 defined in East's Pleas of the Crown, 184 — Sir M. Foster on, *ib.* — other authorities on, 185 — does voluntary killing constitute, 186 — English decisions not good authorities for the law of, 188 — different classes of, 194 — not to be inferred from the mere fact of killing, 198 — law of New York and South Carolina respecting, 204. See *Malice.*

Natural Philosophy. See *Physics.*

Newspaper Literature, J. T. Buckingham's Specimens of, noticed, 249.

New Testament, the, Dr. E. Robinson's Lexicon of, 261 — meaning of *καί* in, 273 — difficulties in the lexicography of, 279 — Hebrew idioms in, 280 — newly formed words in, 281 — new sense of old words in, 282 — meaning of ἐκκλ in, 283 — of 'angels,' 284 — of 'heaven' and 'hell,' 285 — of words signifying Christian graces, 286 — the language of, not pure Greek, 287 — insufficiency of common lexicons for, 292.

Newton's theory of gravitation, usefulness of, 466 — not empirical, but imaginary, 467 — is inconceivable, 468 — mathematical evidence for, 469 — assumed to be true before it is proved, 470 — explains many phenomena, 471 — strength of the argument for, 472 — does not explain the minute and insensible motions, 478 — doctrine of momentum in, 479 — does not explain oscillation, 480 — nor the vortex formed in a tunnel, 483 — doctrine of weight, or tendency to fall, in, 484.

Ochechobe, battle of, in Florida, 12.

Ornament in architecture, 310.

Paget on the non-Magyar nobility in Hungary, 209 — on reforms carried by the crown, though opposed by the nobles, 211 — on the Slowacks, 212 — on the hostility of the Slaves to the Magyars, 213 — on the races in Transylvania, 228.

Palo Alto, battle of, 18.

Parker, H. W., Poems by, noticed, 254.

Particles, importance of, in language, 270 — imperfectly explained by former lexicographers, 271 — monograms on, 272.

Past, effects of a love for the, 120 — admonishing power of, 121.

Peabody, A. P., Christian Consolations by, reviewed, 343 — views of Christian faith maintained by, *ib.* — reputation of, 351 — his qualities of style and thought, 352 — on the need of a Father, 353 — on patience, 354 — and memory, 355 — other citations from, 356 — general merits of, 357.

Peirce, C. H., Translation of Stockhardt's Principles of Chemistry by, noticed, 506.

Pierce, Prof., on Phyllotaxis, 101.

Peschel, C. F., Elements of Physics, by, reviewed, 358 — merits of, 382.

Phillips, Willard, on Protection and Free Trade, reviewed, 396 — an earnest advocate of protection, 397 — needlessly quarrels with political economy, 399 — asperity of his language, 400 — misrepresents Adam Smith, 401 — buffets his own comrade without knowing it, 402 — denies the let-alone principle, 403.

Physics, elementary works on, reviewed, 358 — must be taught in academical education, 359 — must be studied with the aid of mathematics, 362 — how best taught, 364 — text-books of, 367 — how these are to be made, 368 — French and English treatises on, 369 — notice of English monographs in, 370 — Herschel's Astronomy, 371 — Brewster's optics, 372 — Dr. Bird's Elements of, 374 — errors in, 377 — bad effects of mistakes in text-books of, 380 — French works on, 382 — Müller's Principles of, 383 — false translation of this work, 386 — weights and measures in, 390 — thermometrical scales in, 391 — need of better books on, 395.

Planché, Miss, stories for children by, 153.

Poems and Prose Writings of R. H. Dana, reviewed, 115, 133, — sometimes not melodious, but always true to nature, 135 — The Buccaneer, 136 — Factitious Life, 144 — true spirit of the, 149 — to be studied, not merely read, 150.

Political Economy, American, different from English, 397 — Adam Smith the founder of, 398 — attacked by Mr. Phillips, 399 — *laissez-faire* principle in, 403, 419 — definition of the subject of, 404 — one of the moral sciences, 405 — law of the incessant reproduction of wealth in, 406 — analysis of this law of, 408 — shows how wealth increases, 411 — not the art of money-making, 412 — principles of, obtained by abstraction, 413 — too strictly limited, 414 — need of teach-

ing, to the people, 415 — a subject for liberal curiosity, 416 — abounds with evidences of design, 417 — teaches that the natural laws of society must be let alone, 419 — limitations of this principle in, 420 — of rude and skilled labor, 423 — of cities and towns, 430 — of colonies, 432.

Pollok's Course of Time, R. H. Dana on, 128.

Pompey the champion of the aristocracy of Rome, 456 — compared with Cæsar, 464.

Population needs to be concentrated, 430 — effects of different schemes of colonization on, 432 — evil effects of scattering, 435 — Wakefield's mode of concentrating, 436 — how affected by the sale of public lands, 437 — scattered in our Western States, 439.

Pouillet's Elements of Physics, 383 — improved by Müller, 384.

Pressure of heavy bodies, 484 — of the atmosphere, 485 — of fluids, 489.

Protection and Free Trade, W. Phillips on, reviewed, 396 — not inconsistent with the let-alone principle, 421 — widens the field for national industry, 423 — turns rude into skilled labor, 424 — its effects shown in Massachusetts, 426 — opens a market, 428 — concentrates the population, 430 — and thus promotes civilization, 432.

Pulszky, F., Schlesinger's War in Hungary edited by, 205 — on the state of parties in Hungary, 215.

Races, contests of different English, 325 — their relations to each other, 329 — united by a chemical union, 332 — the Anglo-Saxon, 336.

Raiachich, Archbishop, on the barbarities of the Magyars against the Servians, 224.

Religion in harmony with science, 107 — doctrines and feelings of, 109 — fundamental doctrines of, 110 — office of, 111 — written on the works of Creation, 112 — harmonious principles of, 113 — question as to the origin of, 343.

Republicanism, effects of, on history, 446.

Resaca de la Palma, battle of, 20.

Rey on the number of Magyar nobles, 207 — on their rights and privileges, 208.

Richard Edney reviewed, 493 — violates all the rules of taste, 494 — and of rhetoric, 495 — flashes of genius in, 496 — pleasing scenes in, 497 — shows great power of portraiture and description, 498 — cited, 499, 503, 504.

Robinson, Dr. Edward, Lexicon of the New Testament by, reviewed, 261 — Wahl's Lexicon translated by, 275 — high qualifications of, 277 — loves his work, 278 — merits of his book, 289 — improvements made by, 290 — superior to English lexicographers, 291 — does not shirk difficulties, 292 — general commendation of, 293.

Rochester University, Report on the plan of studies in, noticed, 510.

Roman architecture, 296.

Rome, ancient, science not naturalized in, 87.

Rome, History of, 442 — Arnold on the literature of, 449 — the people and the aristocracy in, 456 — decline of the republic of, 457 — anarchy in, 458 — Cæsar's policy in, 459 — his reforms in, 463.

Rural Hours, by a Lady, reviewed, 151 — pleasing characteristics of, 171 — trees, flowers, and insects noticed in, 173 — autumnal changes described in, 175.

Ruskin, John, Seven Lamps of Architecture by, reviewed, 294 — fascination of his style, 302 — analysis of his work, 303 — on the spirit of sacrifice in architecture, *ib.* — on the Jewish services, 304 — on truth in architecture, 306 — on its power and beauty, 309 — on unseasonable beauty, 310 — on life, 311 — memory, 313 — and obedience in architecture, 315.

Sacrifices made in architecture, 303.

Santa Anna, Gen., returns to Mexico, 34 — commanding position of, 37 — advances to Buena Vista, 42 — his appearance there, 44 — sends a message to Gen. Taylor, 49 — defeated, 52 — retreat of, 54 — military plans of, 55 — his scheme of defence, 57.

Savings Banks, service rendered by, 409 — amount deposited in, 411.

Schlesinger, Max, the war in Hungary by, reviewed, 205 — on Magyar politics and the Slowacks, 212 — on the conservative party, 216 — on the Magyar aristocracy, 217 — on the non-Magyar races, 218 — on the war in Transylvania, 229 — on the declaration of independence, 231 — on the tardy concessions to the other races, 234 — on the results of the war, 236.

Schleusner as a lexicographer, 269 — on the meaning of *xai*, 273 — defects of, 275.

Science, Modern, tendencies of, 84 — proceedings of the American Association for the advancement of, reviewed, *ib.* — a consecrated mystery in ancient times, 85 — esoteric even in Greece, 86 — did not flourish in Rome, 87 — in the dark ages, characterized, *ib.* —

cultivators of, regarded as wizards, 89 — effects of the reformation on, 91 — present wide diffusion of, 92 — adapted to the people, 93 — American Association for Advancing, 94 — possible future effects of, 96 — religious character of, 97 — illustrations of this tendency of, 98 — an expression of the ideas of God, 107 — not opposed to poetry, 108 — how it served religion, 109 — opposed to free-thinking in religion, 114.

Science, physical, exclusive trust in, 345 — receives light from religion, 346 — cannot teach every thing, 347 — distinguished from religion, 350.

Scientific Discovery, Annual of, noticed, 508.

Scott, historical qualities of the fictions of, 334 — most brilliant when least veracious, 335 — type of the Anglo-Saxons in his Ivanhoe, 336.

Scott, Michael, the wizard, true history of, 90.

Smith, Adam, the founder of political economy, 398 — favors the navigation act, 401 — his let-alone maxim, 403.

Speculation and practice, needless quarrel between, 396.

Stockhardt, J. A., principles of chemistry by, noticed, 506.

Stories, universal appetite for, 156 — useful purpose answered by, 157 — genius required for, 158 — moral and religious tone of, 159.

Supernatural, man's craving for what is, 344 — organs and faculties for, 347.

Taylor, Zachary, Webster's Remarks on the Funeral of, reviewed, 1 — high character of, 3 — early life of, 4 — commands Fort Harrison, 5 — attacked there by the Indians, 6 — subsequent military career of, 9 — trained in Indian warfare, 10 — takes the command in Florida, 11 — defeats the Indians at Ochechobe, 12 — plan of warfare adopted by, 14 — commands on the Texan and Mexican frontier, 15 — why selected for this post, 16 — advances to the Rio Grande, 17 — marches to Point Isabel, 18 — defeats the enemy at Palo Alto, 19 — and at Resaca, 20 — results of the victories of, 22 — necessary delay of, 23 — reinforcements sent to, 24 — obstacles to the further advance of, 25 — march of, to Monterey, 26 — reconnoitres this city, 27 — begins the attack, 28 — storms the city, 31 — enters the place, 32 — signs an armistice, 33 — his policy justified, 35 — marches to Victoria, 36 — returns to Monterey, 37 — moves to Agua Nueva, 38 — retreat of, 40 — makes a stand at Buena Vista, 41 — prepares to contest the ground, 43 — disposition of troops made by, 45 — losses suffered by, 46 — final attack on, 47 — message from Santa Anna to, 49 — driven from the plateau, 50 — recovers the ground, 51 — victory of, 52 — expects a renewal of the contest, 53 — finds that the enemy had retreated, 54 — defensive position of, 55 — subsequent operations of, 56 — political prospects of, 58 — simple habits of, 59 — elected to the Presidency, 60.

Texas, consequences of the annexation of, 15.

Thierry, Amédée, historical labors of, 341.

Thierry, Augustin, *Dix Ans d'Etudes* by, reviewed, 316 — early political bias of, 318 — devoted to historical studies, 319 — progress of his opinions, 320 — lessons from the autobiography of, 321 — hopes and fears of, 322 — begins his history of the Conquest, 323 — friendship formed by, 325, 340 — development of the theory of, 325 — unity and coherency of his work, 326 — on the different races in England, 329 — on Bertrand de Born, 330 — his facts open to question, 331 — his art better than his theory, 332 — his views incorrect, 333 — indebted to Scott, 334 — his theory useful, though not strictly correct, 337 — praise due to, 338 — overvalues ethnology, 339 — his loss of sight, 340 — other works undertaken by, 341 — his last noble exhortation, 342.

Thronfolge in Ungarn, reviewed, 205.

Trap to catch a Sunbeam, reviewed, 151 — a story finely conceived and executed, 153.

Truth in architecture, defined, 306.

Truth stranger than Fiction, reviewed, 151 — disregard of feeling and delicacy in, 167 — analysis of, 168 — a novel subject for an ecclesiastical tribunal, 169.

Trumbull, Peter E., Austria by, reviewed, 205 — cited, about the politics of Hungary, 210, 211.

United States population unequally distributed, 431 — mode of selling the public lands in, 438.

Vestiges of Creation, refuted by H. Miller, 102.

Vibratory motion, how induced, 477, 480.

Wahl as a lexicographer, 275.
Wakefield's theory of colonization, 436 — practical difficulty in the application of, 438.
Waves, how raised, 481.
Wayland, Dr. F., Report on College Education by, reviewed, 60 — well qualified to write on this subject, 61 — mistaken statement of, 68 — on the decline of professional ability, 71 — change proposed by, 77 — objection to the scheme of, 78. See *College*.
Wealth, what it consists of, 404 — needs to be perpetually renewed, 406 — an equal distribution of, impossible, 407 — ownership of, may be permanent, 408 — circulation of, explained, 409 — grows only by its changes of form, 411 — theory of, large and complicated, 412 — a necessary element of civilization, 416 — grows by turning rude into skilled labor, 425 — cannot increase by agriculture alone, 430.
Webster, Daniel, remarks of, on the funeral of Gen. Z. Taylor, reviewed, 1 — calmness and dignity of, 2 — cited, 3 — on Taylor's fitness for command, 16.
Webster, John W., Bemis's Report of the trial of, reviewed, 178 — excitement caused by the case of, 179 — its dramatic interest, 180 — principles of law applied at the trial of, 181.
Wells, D. A., Scientific Annual by, noticed, 508.
Western States, sale of the public lands in the, 438 — need a dense population, 439 — obstacles to the prosperity of 440 — few cities and towns in, 441.
Whately on the utility of economical science, 415 — on evidences of design in the laws of political economy, 417.
Worth, Gen., operations of, against Monterey, 28.

Zoölogy, Agassiz and Gould on, reviewed, 84 — popular instruction in, 93.